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approach

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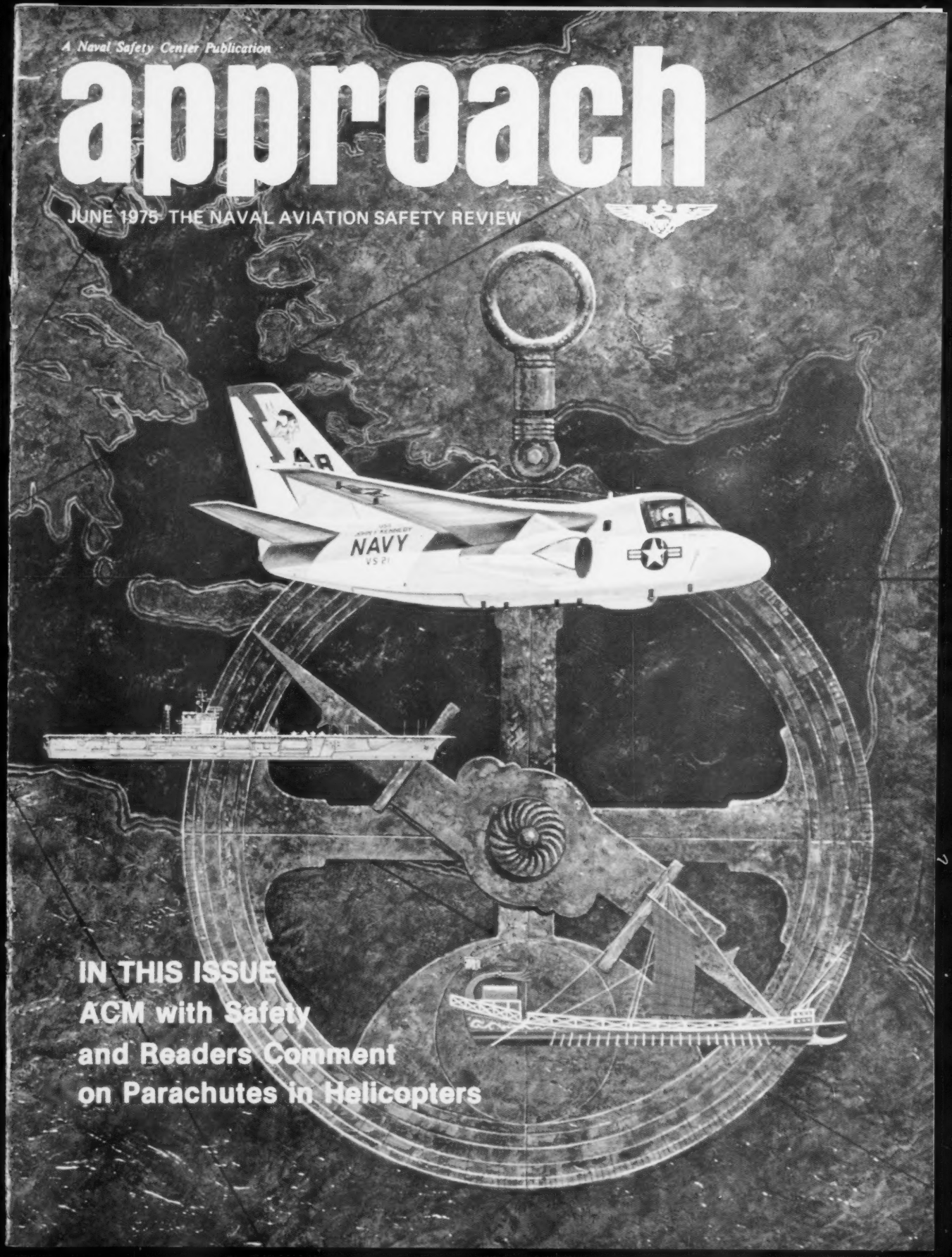

IN THIS ISSUE

ACM with Safety

and Readers Comment

on Parachutes in Helicopters

Two Percent Are Having Trouble

NINETY-EIGHT percent of those involved in naval aviation are, according to all the best evidence, doing a solid professional job, meeting worldwide commitments, and at the same time bidding to establish another all-time safety record during FY-75. The remaining 2 percent, according to *Anymouse,* are having problems. Some of the reports are simple confessions of errors by pilots or maintenancemen. Others point out some hazard which should be publicized or corrected, and still others point to serious infractions of common sense and/or regulations. Herewith, a varied look at some of the more notable reports received during the last 12 months.

Misread Altimeter. An IFRmouse reports that he flew a cross-country to destination in solid IFR conditions (type of aircraft not specified, but believed to be A-3 series). After flying four nonprecision approaches without breaking out, he proceeded to his alternate. Commencing his approach there, he discovered he had been misreading his altimeter by *10,000 feet.* With this bit of vital intelligence, he was able to make a successful approach and landing. Unbelievable? Maybe, but we know of others who have made the same mistake, although we know of none who shot four approaches. Although not specifically stated, it is believed that the

A YEAR

pilot was working with the old "three pointer" altimeter. The scary thing about this is that IFRmouse flew back and forth numerous times across three different busy airways, in the soup, *10,000 feet off assigned altitude.*

Functional Checkflights. Anymouse observed two recent functional checkflights where actions of the pilot did not seem to be quite kosher. An A-7A was scheduled for a functional checkflight because an ADI (attitude direction indicator) had been replaced. During taxi, the ADI started spinning. The pilot started back to the line for a troubleshooter, but as he did so, the ADI steadied itself. He then returned to the duty and took off. Ten feet off the ground, the ADI spun again. Undaunted, the pilot continued the checkflight, then proceeded directly on a cross-country jaunt to another airport. Upon landing and shutting down, this "can-do" airman noticed a hydraulic leak between the main landing gear. The pilot pulled an inspection panel, checked hydraulic fittings, and dry-turned the aircraft. No leak! He then flew the aircraft back to Homebase, landing after dark. He wrote up the following discrepancies:

- ADI spins.
- TACAN unreliable outside 20 miles.
- No doppler.
- No radar.
- Only one mode of ground track.
- Hydraulic leak port aileron.
- No radar altimeter.

It's interesting to speculate what would have happened to this intrepid aviator had his radio been added to the list.

The other postmaintenance checkflight incident involved a COD aircraft. It was loaded with 2000 pounds of mail, launched on a functional test flight with instructions to continue to a CVA for carquals if everything checked out. A loadmaster was aboard the plane, but the plane captain was not; he was grounded for an ear block. After the functional check (which involved an engine), the bird headed for the ship. The only problem was the flaps, which had to be manually operated. The landing was made, mail offloaded, and carquals commenced. Once on deck after a landing, the flaps again had to be operated manually for takeoff. Nevertheless, upon completion of carquals, the aircraft took on 1000 pounds of mail, nine passengers, and launched for the beach. Anymouse questioned the use of this aircraft with the flaps problem and also pointed out that NATOPS calls for a plane captain to be onboard for both a functional checkflight and a logistics flight.

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The reporters of both these incidents doubted the propriety of launching aircraft for functional checkflights to be followed by operational or training flights prior to landing. We don't question this procedure, however, believing there are often valid reasons for combining such flights. Matter of fact, OPNAVINST 4790.2 authorizes such flights under controlled conditions. In both of these incidents,

OF ANYMOUSE

however, it appears the pilots turned in something less than completely professional performances.

Expediency (a shove from above). This Anymouse complains that higher commands task subordinate fleet commands to fly senior officials to various places, occasionally even to fleet safety conferences, and automatically (perhaps unconsciously) pass a "no abort" criteria to the pilot. He says this is particularly bad in regard to adverse takeoff conditions. According to him, squadrons routinely assign special card instrument pilots to every VIP flight for the express purpose of being able to take off legally in weather below minimums. Although this remains the decision of the pilot-in-command, he is under unmistakable pressure. "Show me a special card pilot," he says, "who refuses to take off on a VIP flight when the weather is below mins, and I'll show you a marred and scarred scapegoat."

He fails to offer any specific occurrences to support his complaint, so it could be completely unjustified. Anymouse over the years has proven remarkably honest, however, so he had best be believed. Anyway, the situation is worth thinking about.

Great Exuberance. Anymouse reports on the A-3 driver who was returning to homefield after completing a checkflight involving the horizontal stabilizer. The pilot instructed the navigator to ask for clearance for a low approach (500 feet) over the field, at 480 knots. Clearance was granted and a high-speed pass, followed by a sharp break and a climbing right turn ensued. The aircraft had to be downed for damage done to external engine cowlings and possible internal damage to engine mounts and wing pylons. This is a violation of good sense, A-3 NATOPS, and para 423 of OPNAVINST 3710.7G, by both the pilot and air controller. The navigator did not look too good on this, either. It may be that there will always be violations like this, but why?

Authority of the Pilot-in-Command. An F-4 driver reports on an incident which occurred during a deployment. His problem will be recognized in one form or another by virtually all carrier aviators.

"I was launched on my second night hop of the 24-hour period. Normally flying 1+30 cycles, this particular event was 1+45 (2+00 or more at shutdown). After launch it was passed that the airborne tanker had gone sour.

"Our particular ship had been experimenting all cruise with a new theory which basically states: 'In light of considerably less money and available flying time, caused by a peacetime environment, there can be a great deal of training gained by aircrews if one touch-and-go is made prior to trapping on every night event.' So now we have the situation: One F-4 on his second night event, plus no airborne fuel available on a long cycle, plus required touch-and-go = trouble.

"The entire hop was flown at max conserve, and when I arrived at marshal my concern grew. I knew the touch-and-go was mandatory, but my RIO and I calculated that we would reach the ramp 200-300 pounds below Bingo. While holding and several times after departing marshal, my RIO asked the controller to pass our fuel state and advise on touch-and-go and also inform us if another tanker was airborne. We never got a positive answer; it was always 'We're checking,' 'Stand by,' 'Wait one,' etc.

"The decision had to be made, so I lowered my hook. As it turned out, I did a touch-and-go anyway – unintentionally. By the time I came around again and trapped, my fuel was quite below the comfortable state. When I got down to the readyroom, word came from the 0-9 level – the CVA CO wanted to see me ASAP! Basically, he wanted to know why I didn't make a touch-and-go (he saw hook sparks on my first pass). When I attempted to explain the situation, he let me know in unmistakable terms that I was flying *his* airplanes, off *his* ship, and I had better do what *he* said. Furthermore, I had the pleasure of having my meals served in my room for the next few days! To ease the pain a little, I found that I was sharing the same experience with someone in my sister squadron. (We were not the only ones planning a trap on the first pass – several others had their hooks down, but foul deck waveoffs took the place of the touch-and-go's.)

"This is when the frustration began to build. Ever since my first flight at Saufley Field, it was drilled into me that the pilot-in-command was responsible for the

aircraft. This thought came to mind that night and that is why I made my decision. The ship's CO may own the airplanes I fly and the ship I live in, but who gets burned for the loss of a bird, or worse yet, a life? I don't mind doing the touch-and-go at night, but only when it is combined with a backup of good headwork, i.e., a *good* airborne tanker, short cycles, close bingo field, etc. I still believe that the pilot-in-command is the ultimate authority for that aircraft, and I still believe that if you don't check your six, the carrier environment will inhibit your longevity. But, how does a junior officer convey this to the skipper of a ship? Just who is responsible for the safety of the aircrew and aircraft?"

There's not much doubt in our minds as to who is the final authority as to the operation of the aircraft. Paragraph 231 of OPNAVINST 3710.7G (General NATOPS) states in part: "In the absence of direct orders from higher authority who is cognizant of the mission and urgency of the flight, the responsibility for starting or for continuing a naval flight with respect to weather or any other condition affecting the safety of flight rests with the pilot-in-command of the flight."

Considering your low fuel state and lack of satisfactory communications with the controlling agencies, attempting an arrested landing on the first pass looks like good headwork to us. The problem here seems to be that you were unable to convey the justification for your actions to the CO. Maybe it had to do with your own attitude, or maybe the skipper was just being arbitrary. On the basis of the facts presented, however, it seems to us that the skipper was being unduly hard-nosed.

When all is said and done, though, 2 days in hack is a small price to pay if you sincerely thought your life and aircraft were in jeopardy.

Improper Reporting Procedures. This Anymouse brings to light some questionable reporting procedures being used in his squadron. Seems that one of the aircraft was discovered (while on deck) to have minor wingtip damage. All other aircraft, except one (which was on a cross-country), were inspected for damage. There was none. It was decided to report the damage as being caused by GSE. However, when the other aircraft returned from the cross-country, damage was found which matched the damage on the first aircraft. It was additionally determined that these aircraft had recently flown formation together. Nevertheless, it was decided to report the damage to both aircraft as having been caused by towing one aircraft into another with wings spread. To the best knowledge of anyone, these two aircraft were never spotted next to each other, and even if they had been, their wings would have been folded, thus precluding any such damage from towing. Altogether, this was a minor matter, but it's well to emphasize that proper reporting of incidents and accidents is essential to accident prevention. It is not a matter of the reporting command looking bad; as a matter of fact, those activities which report all incidents are accorded special recognition in computations for safety awards.

The next situation discussed also concerns a lack of proper reporting, as well as other more serious matters.

The CO Should Set an Example. According to Anymouse, in one OV-10A squadron, the CO wanted to take an aircraft on a cross-country. The bird he selected was DOWN for parachutes. The chutes had been packed by an unqualified man without any supervision and had not been checked by any CDI. Nevertheless, the CO upped the aircraft and took off. (Hardly a good example

to the troops.)

In another OV-10A squadron, the CO became directly involved in maintenance at the working level, and on several occasions, overruled maintenance personnel on maintenance matters. No one doubts the authority of a CO to give such orders and expect to have them carried out, but is it a good example? In this squadron, there were not enough aircraft to meet the flight schedule one day. One aircraft was being preflighted, under the direct supervision of the CO who was rushing the men to get the job done. A worn main tire and an oil leak were discovered. The CO rushed the men to complete the tire change and when this was done, told the plane captain to sign off the gripes, stating that the oil leak didn't look bad to him. He then told the pilot who was to fly the aircraft about the oil leak and advised him to turn up the aircraft. When the pilot did so, he was unable to hold the brakes because (it was discovered) a spacer and cup bearing had been left out of the wheel during the tire change. In addition, the oil leak proved to be substantial.

The next incident concerned an OV-10A just out of calendar inspection. The aircraft was downed before flight due to a 200-250# torque split. Three downing discrepancies were written on the aircraft which the prospective postmaintenance inspection pilot thought should be fixed before actual flight. It should also be mentioned that one engine was producing 300# more torque than predicted, which is *not* a normal occurrence. (The only other engine known by the command to be in the same category produced 200-250# more torque than predicted and burned up in about 4 hours of operation.) The squadron skipper, learning of the situation, had the duty officer order another preflight, stating that he wanted none of the discrepancies worked off, and that he would fly the checkflight. The plane captain was pressured into signing off the yellow sheet, but he noted the discrepancies on Part A. Both QA and maintenance control agreed that the aircraft was down and so advised the CO. Nevertheless, he took the aircraft for flight. Because of fluctuating torque and oil pressure, the CO returned to the field early, making a precautionary landing and asking that the crash crew be standing by. After landing, he vetoed an incident report on the basis that none was required since he had not declared an emergency. *This is leadership?*

Perspective. The vast majority of Anymouse reports are those in which individuals "put themselves on report," hoping that others may benefit from their mistakes. Some of those discussed in this article differ in that they point to the mistakes of others. Some of them may have been motivated by less than a complete concern for naval aviation safety, nevertheless, they do point up problem areas, real or potential, which could decidedly affect aviation safety. Accordingly, they are well worth considering. Do any of these apply to *you?*

Ask a Silly Question . . .

IT seems this pilot's magnetic compass was deflected 100 degrees or more by some engine parts he was carrying in the mail cockpit. He had left New York for Cleveland on a hazy, murky evening.

When he descended to land, he was over the Atlantic Ocean. Thinking it must be Lake Erie, he turned left and found New England, which he promptly decided must be Ohio. Still searching for Cleveland, he ran out of gas and cracked up. He pounded on a farmhouse door in Connecticut and asked of the old Yankee who opened it, "Where's Cleveland?"

"Cleveland's dead," said the farmer. "Hoover's President now."

Courtesy *Linn's Stamp News*

Runaway Trim on Takeoff

AN A-4M *Skyhawk* departed homebase on a scheduled functional postmaintenance flight. Aircraft preflight, taxi, and pretakeoff checks were normal, with 6 degrees noseup trim selected. Initial roll and liftoff were normal, but as the gear retracted, the aircraft rapidly assumed an extremely high angle-of-attack.

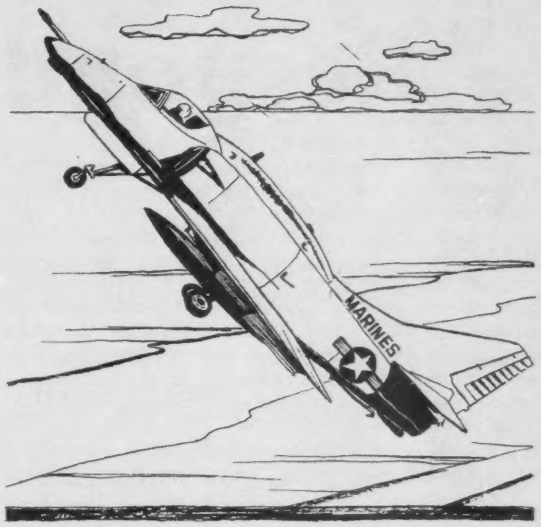
The pilot applied full forward stick and nosedown trim; however, the climb angle increased. Right rudder was used to bring the nose down and prevent stalling. Power was reduced so as to maintain an airspeed of less than 200 knots.

While executing a series of wingover maneuvers with 0-45 degrees of pitch and 0-45 degrees angle-of-bank to the right, the aircraft completed about 540 degrees of turn. During this evolution, both normal and manual override trim were used in an effort to bring the nose down. With no apparent response from either trim system, the pilot pulled the emergency generator T-handle in an attempt to stop the runaway noseup trim. He again activated the horizontal stabilizer manual override lever with no apparent response.

As power was reduced in an attempt to decrease airspeed, a sink rate commenced and the nose continued to rise uncontrollably each time the wings were leveled. With no apparent response from either normal or emergency trim activation, continuing loss of altitude, and insufficient forward stick available, the pilot pulled the manual disconnect T-handle. This, however, produced no improvement in control response.

Descending through 800 feet, the aircraft started to roll left. This roll was arrested, but the bird commenced rolling right. Realizing the right roll could not be stopped, the pilot ejected using the face curtain. He landed safely after one swing in his parachute. The aircraft continued rolling and crashed.

Postaccident investigation revealed that the horizontal stabilizer actuator was positioned against the electrical limit switch (full noseup). Crash damage precluded precise identification of the exact circuit, but the most probable cause of this unprogrammed full-up trim was a shorted trim switch (stick grip control) or a short between wires A and D from the trim switch to terminal panel eleven (Fig. 2-17 of NAVAIR 01-40AVM-2-9). In addition, it was determined that the emergency generator was totally functional; however, it was not rotating at impact. The most probable cause of nonrotation was the RAT's failure to fully deploy due to unusual aerodynamic loads imposed during the inflight



sequence of events.

An analysis of this accident indicates that during the takeoff roll an electrical short occurred, running the trim to full noseup. Following liftoff, as the aircraft was "cleaned up" and accelerating, forward stick authority was insufficient to overcome the unprogrammed full noseup trim. Since normal trim was already shorted to noseup, normal nosedown trim was ineffective and aircraft climb angle increased. Manual nosedown trim was selected briefly, but due to the extremely slow trim rate (.75 degrees/second), insufficient nosedown trim was applied to be effective. Once the pilot released manual nosedown trim (necessary to deploy the emergency generator), the shorted normal noseup trim programmed again to full up. Dropping the emergency generator normally deenergizes stick grip trim, but the emergency generator failed to deploy in this case. In *extremis,* the pilot disconnected his hydraulic flight control which did nothing to help the situation, and subsequently abandoned the aircraft.

As a result of this accident, an interim change (CNO message 062135Z Dec 1974) has been issued to the TA-4F/J, A-4M, A-4E/F, and A-4C/L NATOPS manuals covering pilot procedures for nose pitchup on takeoff. This includes guidance for nose pitchup caused either by runaway noseup trim or a partial hydraulic disconnect.

Our Readers Respond

LCDR Doege's article in the FEB '75 APPROACH has sparked much interest and controversy among our readers. So many letters have come in commenting on this article that it is impossible to publish them all in the normal letters section or even in this special section. Therefore, since there is so much interest on this topic, APPROACH will carry a special section covering reader's comments on helo parachutes in this and the subsequent issue.

Re "Put Parachutes Back in Helicopters?"

NAS Norfolk – It was with interest that I set out to read the FEB '75 APPROACH. The title of the lead article really caught my interest since helicopter survivability and escape systems have been of great interest to me following my rotorhead designation. I labored through the article (hopefully intended to be tongue-in-cheek), and I can only hope that the author's logic and professionalism are at least evident in his connection with the LAMPS Mk-3 Avionics Design.

Perhaps it was intentional to alienate himself from his fellow helo pilots with his discussion of "When it's my time to go, I'll go." Had LCDR Doege utilized his logical scrutiny, he would have realized that this discussion was not a way to attract anyone to his point of view. I had a hard time finding anyone who had read past the first two pages.

While LCDR Doege's esoteric discussion of falling from various altitudes at terminal velocity was well noted, he neglected to say how the pilots and crew, encumbered by required flight and survival gear plus a 'chute, were expected to exit the aircraft and be able to experience the joys of terminal velocity. Assuming average autorotational descent speeds of 2000-3000 fpm, combined with normal operating altitudes seldom above 1000 feet AGL, by the time a pilot and his crew departed the helicopter, the time would be limited in effecting safe aircraft clearance and proper parachute deployment.

A recent article in the JAN '75 *Journal of the American Helicopter Society* entitled "Parachute Escape from Helicopters" provides some evidence that one would experience no major difficulty in achieving vertical and horizontal separation from an autorotating helo. The average exit altitudes, however, were 4400 feet AGL from an H-1 in balanced flight at 100 knots – not very common parameters for emergency exit. There is still some possibility that the main rotor would quickly dispatch the unfortunate 'chutist, particularly at high rates of autorotational descents. I'm sure your statistics would reveal that remaining seated and strapped in are far more conducive to aircrew survivability than trying to leave the helo in an emergency situation at normal operating altitudes.

I was reassured somewhat by the editorial comment at the conclusion of the article, yet I wonder why you published such an article in a professional magazine in the first place. Parachutes? How about some serious discussion on airframe survivability?

LT W. G. Miller

USNA Annapolis – I feel obligated to write you commending LCDR Doege's article on the need for parachutes in helicopters. My background is strictly fighters, but I was completely engrossed in the article from the first sentence. This has to be one of the most entertaining, informative, and persuasive articles I have ever read in your outstanding magazine. I don't have sufficient background to comment on the merits of his case; I only wish I had half of LCDR Doege's talent for expressing my own ideas. It was an outstanding piece of work.

Maj J. D. Howell, Jr., USMC

MCAS El Toro – I especially enjoyed reading the article "Put Parachutes Back in Helicopters?" in the FEB '75 APPROACH. Although I'm a CH-46 copilot, a recent accident here involving an H-53 strongly solidifies my personal opinion concerning 'chutes in helicopters. If each man had worn a 'chute in this case, perhaps some lives could have been spared. My vote is for parachutes in helos.

1stLt Romuald Stone, USMC

NAS Pensacola – I do not desire to criticize or put down an honest attempt to make things safer for those belonging to the fraternity of unrestricted aviators; namely helo pilots. However, I think that the article in the FEB '75 issue of APPROACH concerning the use of parachutes in helos requires some comment. I got the distinct feeling, while reading the article, that helo pilots were being "put down" as unprofessional, unconcerned with safety, and a bunch of clods, because they don't wear parachutes most of the time.

As an experienced helo driver, I believe I have enough experience and qualifications to make some remarks on the use of parachutes in helicopters. NATOPS art. 703a.(2), (3710.7) states that parachutes will be worn on all flights in which any part is to be flown above 3000 feet AGL, and on all functional checkflights above 2000 feet, etc. It also states that the 3000 feet requirement may be waived by unit commanders for specific reasons listed.

In every squadron or command where I have been, compliance with NATOPS was mandatory. I am not so naive to think that no one ever violated this regulation, but violation was certainly not encouraged, overlooked, nor frequent. Every community, and the helo community is no exception, has its few

types who figure they don't have to abide by NATOPS and who provide the material for Grampa Pettibone. Therefore, I think this discussion should be limited to the areas not specifically covered by NATOPS, since there is very little justification for violating NATOPS. I have known very few commanders willing to exercise an option to waive the requirements of NATOPS, unless there is no alternative. Thus I want to address my comments to the flight realm below 3000 feet AGL.

Why do helo crews fly without chutes whenever they can do it legally? There are, in my opinion, some very valid reasons, none of which were presented in the article. Looking at the reasons presented in the article; the first "when it's my time to go, I'll go," really deserves very little comment, since I find it difficult to believe that professional aviators would use that as an excuse for not using equipment designed to save their lives.

I agree, the reason given concerning no provision for stowage space in a helicopter is a poor excuse for not carrying parachutes. However, I do think that for most flight regimes, particularly below 3000 feet AGL, a chute is of little value unless worn continually.

Another reason – that helicopters don't fly high enough – is not really a reason for not wearing a parachute, since it doesn't preclude a crewmember from wearing one. It only tends to make the wearing of a chute redundant. But let's look at the possibility of bailing out of a helo at the example altitude of 500 feet, which supposedly gives us almost 6 seconds before impact. My PRs tell me that the average backpack parachute takes about 3 seconds to deploy from the time the D-ring is pulled. The best I was ever able to do in practice bailouts from an H-2 cockpit (the squadrons I've been in held bailout practice regularly), under ideal conditions with the side door open, was 4 seconds, which included releasing the seatbelt and harness, detaching the helmet cord, and jumping out. The average was 6-7 seconds, and the H-2 cockpit is relatively easy to get out of compared to other helicopters. Need I say more about the chances of leaping out of a stricken helo at 500 feet?

An additional reason; that parachutes are clumsy and restrict motion is true, but hardly a valid reason for not wearing a parachute. Other types of survival gear, like antiexposure suits, are clumsy and restrict motion. I, for one, would not want to find myself flying over cold water without one. However, herein lies a glimmer of what I believe to be a valid reason for not wearing a parachute in a helo. This is the fact that the wearing of a parachute in a helo, in the flight regimes under discussion, actually *decrease* the odds of survival in the event of a mishap or serious emergency, and in many cases, decrease the odds considerably. Why? Most of the flying done by Navy and Marine Corps helo crews is over water at 500 feet or below; therefore, in the event of a mishap, one usually winds up in the water with an exit underwater, a la good ol' Dilbert Dunker. There is little doubt in anyone's mind, particularly for someone who has experienced it, that being strapped to a parachute greatly complicates the situation and hinders expeditious exit underwater, whether an attempt is made to shed it prior to escape or take it along.

The argument that a helicopter's rotor system doubles as a parachute is *NOT* of dubious value, but offers the *best* survival possibilities for almost every type of failure, with or without an available option to bail out. The fact is, *my* arm is springloaded to the full down position. I am fully confident of my own ability to lower the collective, as I hope all other helo drivers are. Most of the time our problems arise after the successful execution of an autorotation, in attempting to egress from the helo, usually underwater.

I have personal knowledge of three known tail rotor failures in H-2s which occurred over water at or below 500 feet. The first happened in 1963, in Naples Harbor at night, and events occurred so rapidly that the pilots were able to do very little. The aircraft began spinning so rapidly that the pilots were blacked out and semiconscious due to the centrifugal G forces and woke up underwater. All four crewmembers escaped with only minor injuries. Their survival was attributed to the pilot's bottoming of the collective at the commencement of uncontrolled flight and cushioning the impact with up collective at the bottom.

The other two happened about one week apart in 1972; the first from the det of which I was OinC and was a classic of professionalism, coolness, and knowledge of NATOPS procedures by the crew involved. It occurred in an HH-2D at 200 feet. The associated vibrations prior to the actual tail rotor failure were so great that instruments actually popped from the panel and the aircraft was barely controllable. However, the pilots accomplished the ditching checklist, got out complete but shaky-sounding voice reports, and attempted to fly the aircraft back to the ship. They had placed themselves at about 50 feet, which allowed them to expeditiously ditch when the tail rotor finally failed completely and they started spinning. (They did not know until they actually started spinning that their problem was an impending tail rotor failure since they had directional control up to the point of full failure.) All crewmembers escaped without injury.

The other tail rotor failure happened to an SH-2D from one of the accompanying destroyers and was a carbon copy of the previous, except that the pilot climbed to 500 feet from 200 feet, vice descending to 50 feet, and was commencing an approach to a ship, when the tail rotor let go. This resulted in some injuries and one fatality to a crewman who, it is believed, was unable to exit the aircraft after impact.

My point is that most helicopter mishaps and malfunctions occur at low altitude and/or over water and are either handled quite effectively by proper execution of NATOPS emergency procedures, or result in such violent movements and rapidly changing unusual attitudes, that the crew would have extreme difficulty getting out of the aircraft in the air.

The way we should be progressing in this area is toward escape systems similar to those discussed in LCDR R. B. Recknor's article, "Helo: No Easy Way Out," NOV '74 APPROACH. In the meantime, some sort of parachute already in the seat, that crewmembers could quickly and easily attach when flying above 3000 feet, but would not be attached for low flying and would be such that it would not hinder or prevent exit from the aircraft. In my opinion, helicopter crews and passengers should not be burdened with equipment that is detrimental to their survival in practically every type of mishap or flight regime encountered.

LCDR L. B. Kauffman

CGAS Port Angeles, WA – As a rotorhead with 17 years and 3000 hours in type, I have watched with some dismay the trend which has developed over the years to operate helos at ever-higher altitudes. Altitude per se has never bothered me, but the inability of the crew to survive a serious emergency at altitude has. One advantage a rotorcraft has over other types of flying contraptions is that you can get it on deck in a hurry in most situations. However, a pilot should give up this advantage only after serious thought, or after providing himself an alternate out, i.e., parachute.

CAPT C. W. Swickley, USCG

SAFETY THROUGH COMMUNICATION

By CAPT H. M. Hoffman, USMC

DURING the period 1 July 1972 through 30 September 1974, Marine Aircraft Group 36 flew 82,047 flight hours, experienced 12 major aircraft accidents, and submitted 370 incident reports. The distribution of the accident and incident reports is displayed on the accompanying graphs by CAPT R. E. Yeend, USMC.

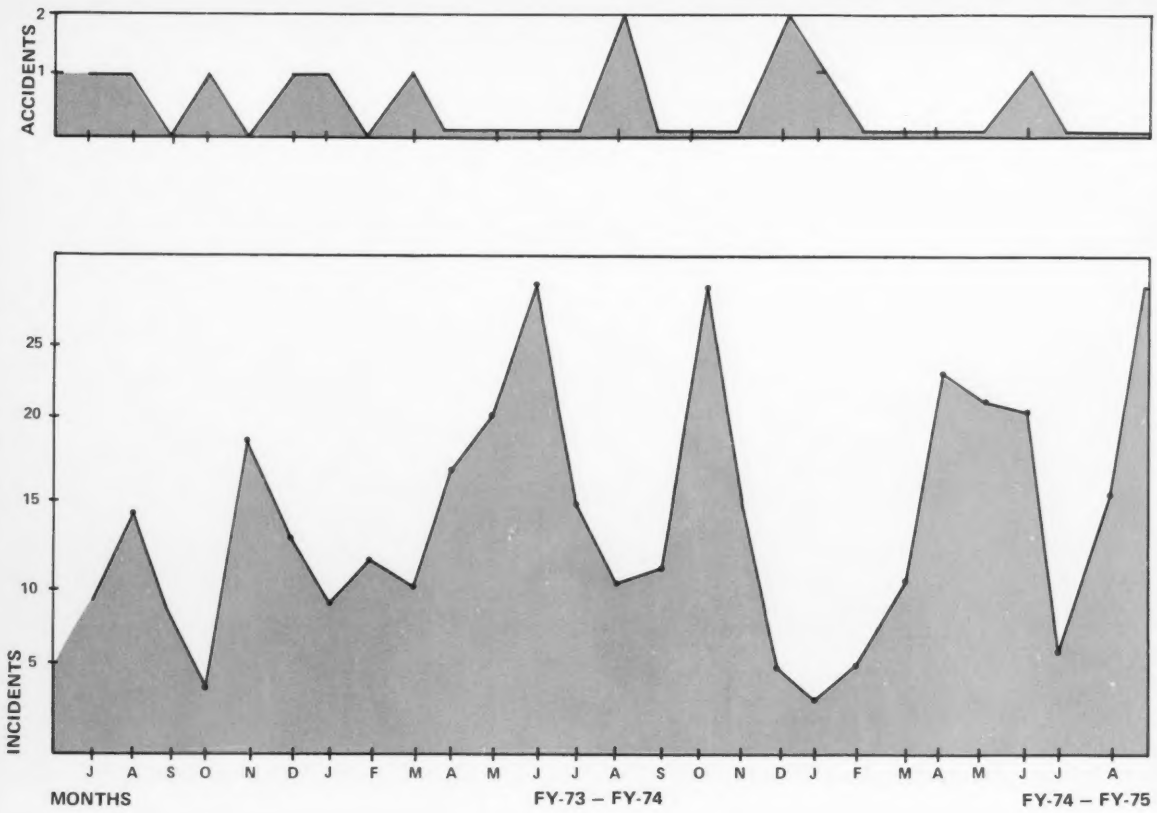
A comparison of these graphs produces an interesting result. During every month reflecting a decline in the number of reported aircraft *incidents*, a rise in the number of major aircraft *accidents* occurred. Conversely, during all but one month in which the number of reported incidents increased, the number of major accidents decreased.

Does this mean that by having more incidents we decrease the probability of incurring accidents? Surprisingly, the answer must be affirmative to some degree.

Major aircraft accidents can very often be described as a "comedy of errors." Not comical, but the result of a sequence of events, the interruption of which, at nearly any point, would have resulted in an aircraft incident rather than an accident.

An excellent example is the pilot of a dual-engine H-1 responding to a No. 1 engine chip light by unintentionally securing the No. 2 engine. A crash landing resulted because No. 1 was really FODed and couldn't produce sufficient power for flight. In this instance, had the act of accidentally securing the No. 2 engine been removed, an aircraft incident would have resulted. Consequently, an increase in the number of incidents would be accompanied by a decrease in the number of aircraft accidents, if only by one.

I prefer, however, to think that the negative correlation between the two, aircraft incidents versus accidents, is not totally the result of the statistical interdependence noted above, but a dependence upon a third or outside force. I suggest that they are dependent upon the overpowering outside force known as effective



communication.

What happens when an incident is reported? We all know that it is entered in the aircraft mishap computer bank at the Naval Safety Center and probably in more than one form and area. We also know that reported incidents can be utilized by NAVAIRSYSCOM to identify weak systems which should be redesigned or eliminated. But, what actually happens when an incident is reported?

First of all, someone in naval aviation, perhaps a pilot, perceives that something has gone wrong. He then takes corrective action, possibly the execution of an emergency procedure to ensure a successful landing. The yellow sheet, not a talk with the aviation safety officer, is where the report begins. A professional aviator will have appropriate maintenance personnel standing by while he writes up his gripe to ensure that the "experts" know what he's trying to say and that they have an opportunity to question him on other symptoms of the malfunction.

He then goes to the readyroom where all of his buddies get answers to their "what happened?" questions. Next is a debrief by the aviation safety officer and completion of the aircraft incident report. During the AOM's "show and tell" session, he'll brief the incident to his squadronmates, plus what's being done to prevent its recurrence.

As a result of effectively communicating the circumstances surrounding the incident, pilots, maintenance, and line personnel become acutely more attentive to the malfunctioned device during installation, preflight, and phase maintenance evolutions. In addition, pilots and crewmembers receive increased motivation to review the emergency procedures required in the event of similar failures.

One point is clear: when a squadron's frequency of reported incidents is high, the level of accident-preventing communication in the unit is significantly higher than in those outfits vying for the mystical "Zero Incident Award."

In MAG-36, we focused our attention on effective communication in the prevention of accidents from January to July 1974, and our major aircraft accident rate decreased from 2.79 for the first two quarters, FY-74, to a .51 for the second half of the fiscal year.

The key to a viable aircraft accident prevention program is effective communication. Without it, the safety goals of naval aviation will never be met. ◄

As members of the INDEPENDENCE EOD (explosive ordnance disposal) team stand by in the motor whaleboats, other members climb atop the crippled helo ready to attach it to the ship's boat and airplane crane to hoist aboard. Quick action by this team, the Indy's deck department, and the USS SAMPSON (DDG-10) motor whaleboat crew saved the crewmen and the helicopter.

HELICOPTER RECOVERY

By CDR E. R. Sands
CO, HS-5

PERHAPS the four most dreaded words in carrier aviation are "aircraft in the water." This usually signals the loss of an aircraft and possibly injury or loss of an aircrew. This is the story of an occasion when a potential tragedy became a routine aircraft incident. The recovery of a helicopter in the water is a rare occurrence and is a particularly difficult task at night.

Members of the INDEPENDENCE's EOD team have attached the hook and are ready for the ship to haul it aboard. Professional performance by all parties concerned resulted in this helicopter being returned intact to USS INDEPENDENCE just 2 hours after its ditching.

About 2045, LTJG Ronald Pignataro, HAC of an SH-3D, executed a power-on autorotation to a water landing from 500 feet and 80 knots because of indications of an impending tail rotor failure. Word of his ditching was rapidly passed to the carrier and escort ships while a SAR helo was vectored to the downed aircraft.

At 2055 the SAR helo reported the aircraft floating high in the water with rotors secured and flotation bags inflated. LTJG Pignataro reported everyone in fine shape and stated the aircraft was capable of being recovered. About 2100, USS SAMPSON (DDG 10) entered the area and deployed a lifeboat to the downed helo. SAMPSON was extremely careful to approach the area slowly and not create any wake which might cause the helo to capsize. The helo crew was picked up by lifeboat after they had secured all aircraft doors and hatches. Upon arrival at SAMPSON, the helo pilot directed the lifeboat crew in towing procedures. (SAMPSON's crew was familiar with the towline position because of a briefing aboard INDEPENDENCE about 3 weeks earlier.)

Meanwhile, the carrier began to recover all airborne aircraft. Due to a minimum wind situation, INDEPENDENCE was able to turn and close the downed helo while recovering the rest of the Air Wing.

Concurrently, the salvage team was being assembled. Squadron personnel began briefing Deck, Air Department, and EOD (Explosive Ordnance Disposal) personnel on correct procedures and areas of extreme caution (flotation bag vulnerability, hazards of tail tow, reduction in wake, etc.).

The EOD swimmers were given a thorough briefing on the helo hoisting sling and made several dry runs under the direction of HS-5 personnel. The squadron maintenance officer went in the first lifeboat to provide on-the-spot expertise. As SAMPSON's lifeboat slowly (2-3 knots) towed the helo alongside INDEPENDENCE, the EOD swimmers approached the helo. The two swimmers slowly climbed to the rotor head, removed the "beanie-type" fairing, and began attaching the hoisting sling.

When the helo was in position abeam the elevator, the towline was passed to the deck crew. An additional swimmer entered the water and attached a line to the tailwheel tiedown ring to stabilize the helo fore and aft. With the hoisting sling attached, the B and A crane lifted the aircraft clear of the water. Above elevator No. 4, the gear was pulled down, and the helo was back on deck, exactly 2 hours after landing in the water.

The following factors contributed to the success of this operation:

- First, the early recognition of impending rotor failure and the successful night water landing by LTJG Pignataro.
- A low sea state (1-2 feet) enabled the helo to remain stable and upright in the water.
- The boatcrews from SAMPSON were well trained and had recently received a helicopter rescue/salvage briefing. This enabled them to easily locate the towline.
- EOD swimmers and Deck Department personnel were thoroughly briefed and prepared. The addition of a squadron representative to the boatcrew provided on-the-spot expertise.
- The quick yet cautious response of all parties involved greatly aided the rapid recovery. Extreme care was taken by the carrier, the destroyer, and the

whaleboats not to create any wake which might have capsized the helo.

- The largest single factor contributing to this successful recovery was the professionalism exhibited by all personnel from beginning to end. The slow, methodical one-step-at-a-time manner in which they carried out their specific responsibilities allowed for minimum mistakes and maximum caution. Professionalism turned this potentially disastrous accident into an incident.

After the salvage operation, inquiries were received concerning recommended procedures for destroyers during helicopter salvage operations. Realizing that actual salvage of helicopters by destroyers is nearly impossible, the basic question is what methods should be utilized to keep a ditched helicopter afloat until arrival of a suitable recovery vessel.

The following comments are submitted for destroyers on H-3 salvage methods:

- Experience has shown that most unsuccessful H-3 recoveries are the result of well-meaning yet untrained personnel attempting to assist but committing errors (i.e., DD wake causing helo to capsize; puncturing flotation bag when approaching helo; incorrect towing procedures). All boatcrews should receive helo emergency and rescue procedures briefings during the earliest possible period after joining the carrier.

- Integrity of the helicopter is paramount. All doors and hatches should be secured and flotation bags inflated.

- The attachment of flotation devices or lines to the helicopter is considered difficult and creates the hazard of unequal buoyancy. The best method to maintain H-3 watertight integrity is by towing the helo into seas at 1-2 knots. Caution must be exercised to ensure towing is done only by the towline attached to the helo port side forward.

DO YOU NEED YOUR OWN PILOT-ERROR ACCIDENT?

By LT D. L. Sturgeon
VAQ-130 Det 3

IF MONEY were an unlimited resource and the Navy's aircraft inventory were inexhaustible, I would recommend that each and every naval aviator experience his own pilot-error accident.

Let's, for the sake of argument, say that no injury or property damage is involved in this accident. Through your procedural mistakes or errors in judgment, you plant a perfectly good aircraft in a deserted field, after ejecting safely. Indeed, a wasted aircraft. But one thing's sure: you, the pilot who erred, will not make the same mistake again.

Likely, you will first answer to your skipper. He'll ask, "What happened, Ace? Did you follow NATOPS?" Days, maybe even weeks, will go by during an accident investigation in which you will explain over and over again how you "blew it." You'll be astonished at how many mistakes you made prior to your accident – all of which contributed. These, plus every habit – both good and bad – will surface for you and the world to see.

Do you think your skipper back in the training command will have forgotten the "Ace?" He remembers and has records to prove it. Airing all the dirty linen, you might call it.

Finally, the investigation is finished, and you are astounded at the number of NATOPS violations referred to in the findings. "I did all that?" you wonder incredulously.

Now, the noose is around your neck, and the Field Evaluation Board is going to decide whether or not to let you hang. More weeks of investigation follow. This time, it's not a squadron-convened accident board collecting facts. This board is likely to gather many of your old friends and acquaintances to gain a relatively subjective look at you as a pilot. You watch as they file into the hearing. "There's ole buddy Joe," you say to yourself, "he'll put in a good word for me." "Uh-oh, there's that no-good plumber Jones. He's sure to bring up the incident where I almost hit the sleeve while pressing the target on a gunnery run. He was mighty shook up by our near-miss. That won't look good to the Board." Finally, you're allowed to make your statement. The Board, because of your previously clean record, decides to give you an "up."

Now, it's back to flying. Of course, there's liable to be a JAG investigation and, if there's a supervisory error as a contributing factor, the skipper will probably still be answering questions. The accident won't soon be forgotten, neither will the stigma of your Delta Sierra.

Anyway, you're back in the saddle once more – a little older and hopefully a lot smarter. No, you won't make the same mistake again. Plus, you'll probably fly by the book like you never have before. Suddenly, the old adage "What would the accident board say?" becomes a haunting voice as you contemplate that 400-knot break vice a 250-knot entry. Indeed, you are now truly safety conscious and a NATOPS believer.

See what a pilot-error accident can do for you, and why I facetiously recommend one for each pilot?

Unfortunately, our money and our aircraft – not to mention our lives and property – are limited resources. We just haven't enough of these assets for all of us to experience our own accident.

Then, why don't we learn by the mistakes and experiences of others? I seriously doubt anyone could come up with a completely original pilot-error accident – someone has made the same mistake before. And, although most would not believe it, an accident *CAN* happen to you.

As an ASO, it continues to amaze me how some learn nothing, but instead, continue in their fools' paradise just waiting for the right set of circumstances. I recently overheard one aviator explaining his technique for lighting a cigarette when his lighter was low on fluid. He unhooks his oxygen mask, takes a deep breath of pure O_2, and blows through the cigarette. He claimed great success at getting a light on just the sparks from the flint!! My God, after all that's been said and done concerning smoking in jet aircraft, this is unbelievable! Yet, examples such as this could be listed *ad infinitum!*

What does it take to make people learn? A safety officer? NATOPS? Another accident? An accident board? A Field Evaluation Board? Your *own* pilot-error accident?

Unfortunately, there's no guarantee that you'll live through your own accident to benefit at all. ◄

ACM

With Safety

By J. S. Brickner, A. V. Murphy, R. L. Ferris, S. E. McFarland, Fighter Squadron ONE HUNDRED ELEVEN

FLYING and fighting the *Phantom* to the outer reaches of the flight envelope need not be a hazardous ordeal or lead to the destruction of valuable aircraft. Over a period of 2½ years of accident-free flying, Fighter Squadron ONE HUNDRED ELEVEN engaged in a vigorous air combat maneuvering program with the assumption that a continuous, aggressive, and professionally managed effort could produce consistently superior ACM performance with no compromise in safety. The rules of engagement as outlined by the Wing Commander were strictly adhered to and all avenues of training were utilized to develop and maintain aircrew compliance. This command's experience has indicated that the key to a safe ACM program lies in a carefully planned and closely monitored syllabus, and has, as a basic principle, the sustained maintenance of a high level of aircrew aggressiveness and desire to win.

Budget constraints, the increased awareness of the irreplaceability of aircraft assets, and lack of actual combat involvement have fostered two basic schools of thought on how to conduct ACM training. Pilots are often limited in the number of ACM training flights and restricted from exploring certain flight parameters. This "what you don't know can't hurt you" theory is precisely why ACM accidents occur. When an

inexperienced pilot finds himself below the "minimum" airspeed or above the "maximum" angle-of-attack, he has "broken the rules." The resulting disorientation and apprehension often causes panic and inability to recall rehearsed unusual attitude and departure/spin recovery techniques.

The most rewarding approach to ACM safety is that which places the inexperienced fighter pilot in a position to learn the fighting capabilities of his aircraft through demonstration, execution, repetition, and winning attitude. Only by aggressively exercising his aircraft through all flight regimes can the fighter pilot develop the skill, understanding, and confidence which leads to safe aerial combat maneuvering. Thus, safety becomes the product of familiarization and confidence, not a hindrance to the fighting ability of the Navy fighter pilot.

Every avenue of training was utilized to develop aircrew proficiency in stretching the *Phantom* to the limits of the flight envelope. Aggressiveness, built on a thorough knowledge of the capabilities of the aircraft, as well as its limitations, was the desired goal. This was accomplished through extensive use of the 2F88 flight simulator for spin recovery practice and an intensively flown ACM syllabus. Initial phase of the syllabus consisted of "confidence hops" flown with experienced aircrewmembers demonstrating aircraft operating envelopes to the limits of controllability. With this experience, the new pilot was flying the *Phantom* to the edge of the flight envelope shortly after reporting aboard.

Fighter Squadron ONE HUNDRED ELEVEN had enjoyed outstanding success in its ACM training program. The record of 2½ years of accident-free flying is an enviable achievement in itself. What is truly remarkable, however, is that the command *emphasized* ACM training. During 1974, nearly 12 percent of the 3000 hours flown consisted of actual ACM. Nearly 500 sorties had ACM training as their basic mission. The ACM rules of engagement were briefed on all day VFR flights. All available external training assets were utilized: Navy Fighter Weapons School, VF-126, the A-4/T-38 adversary program, dissimilar ACM with local F-8 squadrons, and initial verification of the Yuma air combat maneuvering range. Intensive ACM training was conducted for one week at the F-106 College Dart adversary program at Tyndall AFB.

Throughout this extensive ACM training, no major airframe overstress resulted, and only one departure requiring use of the drag chute occurred. Compliance with the rules of engagement, as outlined by the Wing Commander, has kept all flights in a safe environment. Squadron operating procedures dictated a further restriction of 10,000 feet vice 5000 feet as a simulated ground level. Rules of engagement were a mandatory part of every brief and each flight was further required to discuss loss of control/departure/spin procedures.

Thought-provoking ACM discussions are encouraged at times other than during normal briefings and debriefings. Aircrews who had been at zero airspeed, had departed aircraft, fought at half-flaps, or had used in trail or vertical tactics, were given opportunities to express their ideas. Top Gun graduates returned to the squadron early in the turnaround and were utilized extensively at aircrew briefings.

The "Sundowners" have proven that ACM can be accomplished safely through professional training and individual aggressiveness. The desire to win, combined with absolute compliance with the rules of engagement, must be instilled in every pilot and RIO. Aggressiveness and experimentation are encouraged and need only be controlled and properly supervised. The spirit leads not only to safer flying, but to better fighter aircrews. "Anything else is rubbish."

Aggressive ACM training *can* be accomplished without accidents.

JET BLAST DEFLECTOR

JBDs (jet blast deflectors) have been involved in six aircraft mishaps since September 1974. Two of these mishaps were serious and involved major personnel injuries, in addition to substantial aircraft damage.

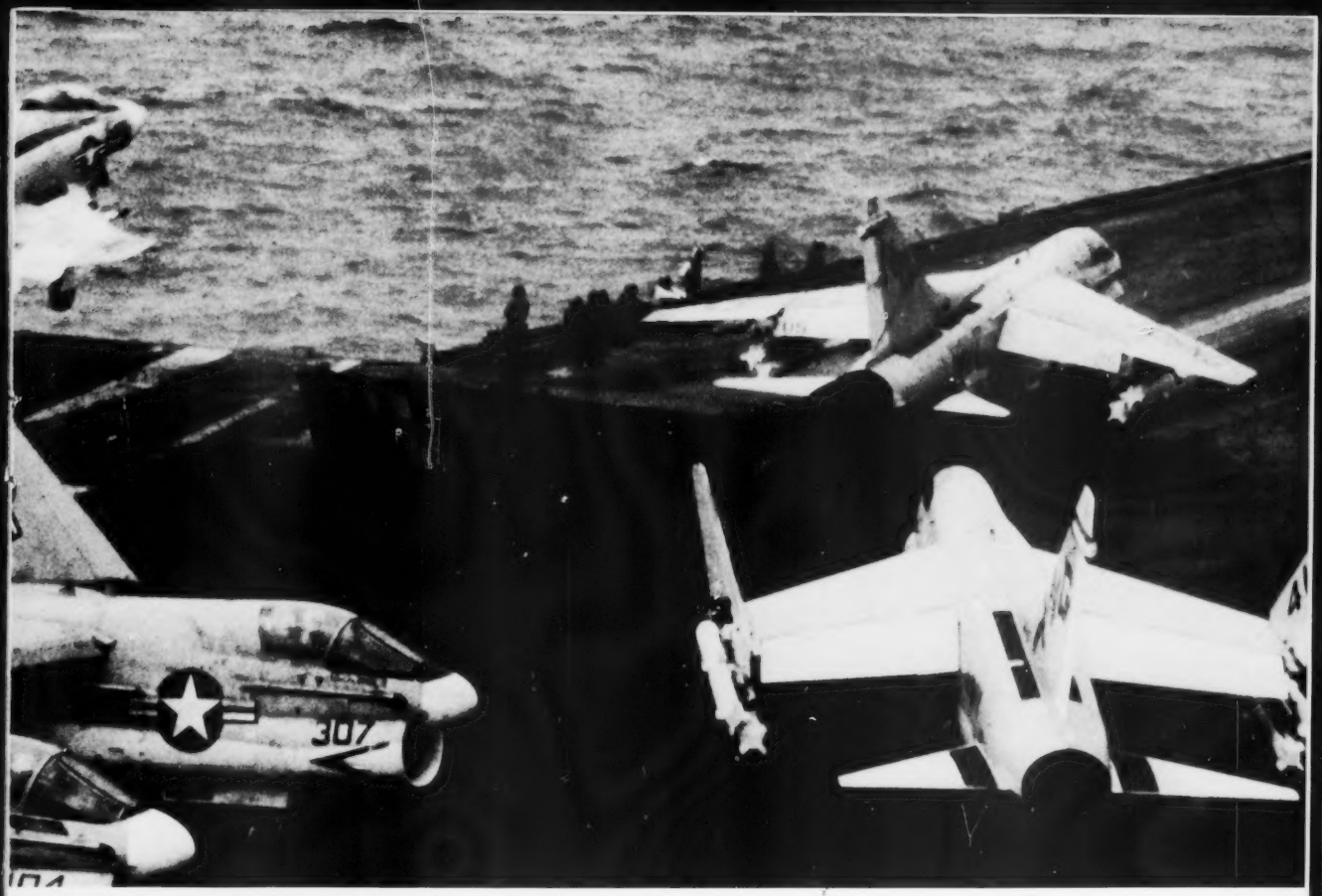
In one case, a JBD was raised into the outer wing panel of a taxiing A-7, resulting in minor damage. In another case, an A-7 was tensioned with the JBD down. The subsequent jet blast damaged another *Corsair II* being spun on the No. 1 elevator. In a third case, three flight deck personnel sustained shrapnel injuries (one major and two minor) and four aircraft received shrapnel damage when a C-2 prop shattered against a JBD which was inadvertently raised. In the fourth and fifth cases, JBDs were raised into the fuselages of an F-4J and E-2B, causing limited and minor damage, respectively.

The sixth mishap – most recent and most disastrous – involved an E-2C whose starboard prop disintegrated when the JBD was prematurely raised. Two men received major injuries and three men minor injuries as a result. In addition to substantial damage to the E-2C directly involved, shrapnel damage was inflicted on another *Hawkeye,* two *Phantoms,* and a *Tracker.*

Although all the endorsements have not yet been received, it appears that the following factors contributed to the accident and are worth recounting. A respot was commenced for a scheduled underway refueling later that evening. The E-2 was spotted immediately forward of No. 1 JBD panels in the area referred to as the point. The aircraft was positioned further inboard than normal to ensure that most of the aircraft's fuselage was over the flight deck and not protruding over the starboard side of the CV. This is standard practice for underway refueling ops. Spotted as such, the starboard propeller was directly over the upper corner of the outboard JBD panel on catapult No. 1.

Prior to securing that evening, the aircraft handling officer instructed a yellow shirt assigned to the V-1 night crew to put the *Hawkeye* into final spot, tail over the water, after securing from refueling ops.

At about 0500 the next morning, the final spot commenced. The first event, scheduled for 0700, would inaugurate a major exercise. The launch was comprised



MISHAPS

of 41 fixed-wing aircraft and two helicopters.

At about 0545, the flight deck officer reported for duty. He checked the air plan and the progress of the final spot . . . and, noting that the E-2 had not been put into position, questioned the flight deck CPO as to its actual position. The chief didn't know. He then directed a yellow shirt to check the actual position of the bird and respot if necessary.

At 0615, the JBD operator assigned to the No. 1 catapult reported topside to assist in performing preoperational checks of the equipment. He checked the JBD panels for cracks and cooling water leaks. He did not note the position of the E-2's starboard prop in relation to the outboard JBD panel. He then proceeded to his deck edge station in the starboard catwalk to complete the preoperational checks.

At 0630, the crew of the E-2 manned their aircraft. Walkaround preflights were accomplished during darkness (sunrise was at 0705). The CV was operating under EMCON and "darken ship" conditions. The forward island floodlights were not on and flight deck radio headsets were prohibited from use. During this period, the E-2 squadron line chief petty officer informed an unidentified yellow shirt director of the E-2 prop and JBD proximity. At approximately 0640, the E-2's engines were started. It was at this time that the pilot in command occupying the copilot seat noted the position of the starboard engine propeller over the JBD panel.

Another E-2 was spotted on No. 1 catapult, aft of the nose tow shuttle box with the tail section of the aircraft extending about 3 feet over the center JBD panel. Preoperational catapult checks were completed on No. 1 catapult at 0651 but were still in progress on catapult No. 2 at the time of the mishap. At approximately 0654, the E-2 line chief petty officer advised the yellow shirt director who had taken control of the aircraft of the overlapping situation that existed between the starboard engine propeller and the JBD. The director acknowledged, then gave the signal to remove tiedown chains and wheel chocks. Being unable to taxi the aircraft forward toward the center of the flight deck due to proximity of other aircraft, the director gave the reverse thrust taxi signal to the pilot at the controls in an attempt to back the aircraft closer to the starboard deck edge to clear propeller and JBD. Due to a one-degree

port list, however, the aircraft was unable to move. The director then gave the "hold brakes" signal to the pilot and directed four blue shirts to push the aircraft while simultaneously giving the reverse thrust signal to the pilot. Again, the attempt to move the E-2 backwards failed.

The director then requested a tow bar and tractor to push the aircraft clear. The tow bar was hooked up, but there were no tow tractors immediately available. Simultaneously, the E-2 spotted aft of the shuttle of No. 1 cat was moved forward.

At 0659, the No. 1 catapult JBD operator visually ensured safe clearance between the tail section of the E-2 on the cat and the JBD, then raised all three panels. As the outboard panel raised, it contacted the spinning propeller. The JBD operator immediately lowered all three panels.

At impact, both engine power levers were in the ground idle range. The starboard propeller blades immediately disintegrated, throwing shrapnel in a 180-degree arc forward of and parallel to the propeller arc, resulting in numerous injuries and extensive damage. The pilot in command, occupying the copilot seat, immediately secured the starboard engine and then the port engine utilizing the emergency T-handles.

At this time the aircraft began rolling athwartships toward flight deck center. The pilot at the controls reset the parking brake and selected aux brakes, but the E-2 continued rolling. The pilot in command then dropped the tailhook and began actuating the emergency handpump. The aircraft was ultimately stopped 96 feet from its initial spot when a squadron plane captain tossed a wheel chock under the port main landing gear. Brake failure was caused by shrapnel damage to the hydraulic and pneumatic systems.

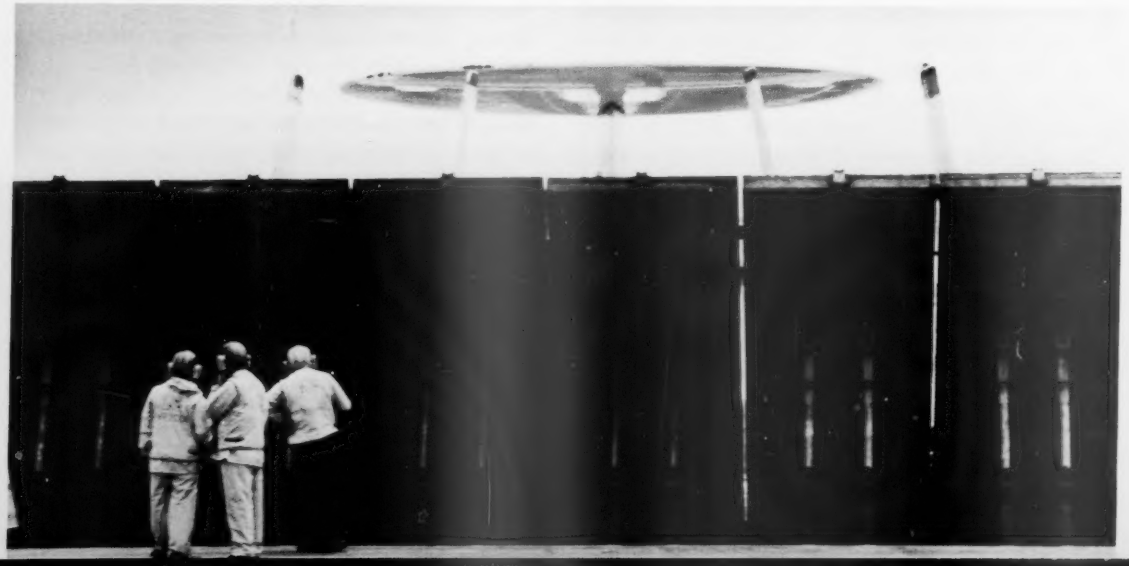
Although the JBD operator was the person who most directly caused this accident, he was a victim of a trap unknown to him and unwittingly set by a series of events over which he had no control. The trap was initiated the moment the V-1 night crew director failed to respot the E-2 as directed by the aircraft handling officer. The aircraft handling officer did not follow up to ensure that the situation had been corrected. Although the flight deck officer astutely noted the continued discrepancy upon reporting for duty, he (as had his predecessor) failed to follow through to ensure that his order to move the aircraft had been carried out. Likewise, he was not given the benefit of any feedback from the director. The director controlling the aircraft during and after engine start was aware of the situation but made no effort to ascertain whether or not the JBD operator was also cognizant and, if not, to inform him that the JBD could not be raised until signalled by the director.

The squadron commander in his endorsement to the mishap report stated:

"The common denominator most readily apparent is the seemingly total lack of teamwork between those personnel whose job it is to safely accomplish the myriad of evolutions necessary to conduct carrier aircraft launch operations. The only possible way that the aforementioned evolutions can be accomplished efficiently and safely (particularly in these times of personnel shortages) is through teamwork. Teamwork simply cannot exist without communication between the players."

The type commander summed up the JBD mishaps by stating: "Carelessness or a breakdown in communications between handling personnel/catapult crew and JBD operators appears to have been a factor in all these mishaps.

Complacency, haste, and inattention to the job at hand must constantly be battled in the fatiguing and repetitive tempo of carrier ops. There is no substitute for well trained and well supervised personnel in these demanding jobs." ◄



SET CONDITION V

By LTJG David Miles

AVIATION in the patrol squadron community is quite a bit different from its fighter or attack counterpart. One difference is the length of time spent airborne on any given mission. Buzzing around for 10 to 12 hours at a stretch poses some unique problems in the area of fatigue and, consequently, flight safety. Sure, we've got a modest inflight galley, complete with the traditional Navy coffee urn. But, sometimes, even the dregs from that pot don't seem to shake loose the fatigue of a long, all-night mission.

There was one particular day that seemed like two. We had taken off into the sunset and, some 11½ hours later, found ourselves within sight of land again the following morning just at sunrise. As third pilot, I was not to be involved in the landing at Homebase.

Nearing destination, I found myself standing over the navigator's shoulder, reviewing some of the events of the flight. I thought we'd be landing inside of 20 minutes, so I left the TACCO and Nav and the two sensor station operators to their own musings, went forward, and took my ditching station.

I remember looking out the observer's window, seeing the coastline below, and thinking that we must be getting close. I knew that we had started our final descent, but didn't recall hearing the flight station announce it to the crew. I heard a pop as the landing gear was selected down and felt the pleasant buffeting as the gear came down and locked. All seemed normal. Then I remembered my lapbelt and wondered how I could have missed the order to set and check Condition V for landing. Well, I hadn't missed it. The announcement was never made. Seconds after I had fastened my belt, we touched down. This time it wasn't the normal, smooth, VP aviator touchdown. One of the guys up front had all but planted this one in the asphalt. Damn, I thought, I hope the rest of the crew was strapped in. As it turned out, no one except myself had been strapped in for landing.

As we turned off the runway onto the taxiway, I heard the cursings of some of the crew. A blur rushed past me on its way to the flight station. I thought it was the TACCO, but couldn't be sure because I'd never seen a TACCO move that fast before. There were quite a few heated words exchanged while we secured the aircraft in its parking spot, but the entire situation was not reconstructed for me until we had gathered in the privacy of the open air flight line when the plane commander got off the airplane.

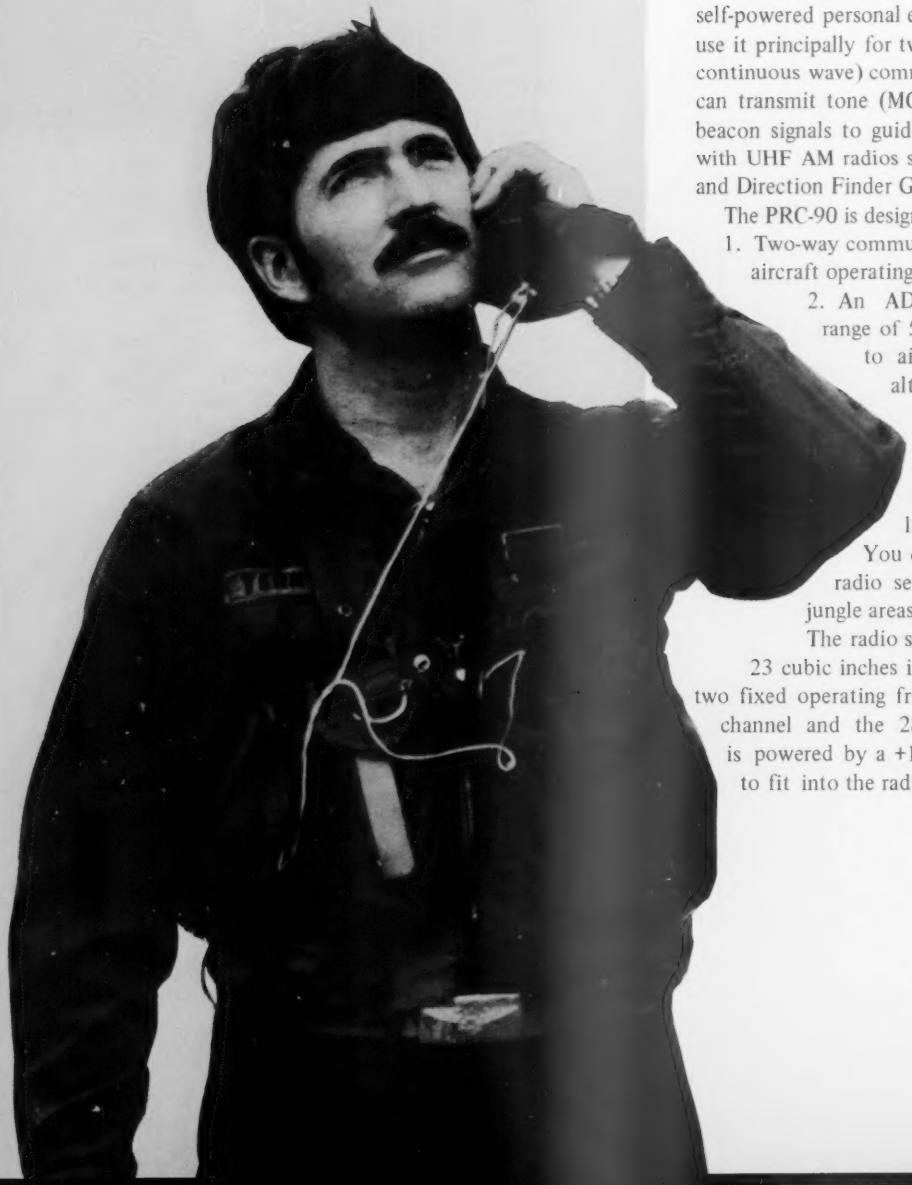
The pilots claimed to have announced to the crew over the ICS that they should strap in, in preparation for landing. They admitted that this was never acknowledged and also admitted that the announcement was not made over the public address system. Since no one in the aft end of the aircraft was wearing headphones when the announcement was made, no one heard the orders from the flight station. More significantly, none of the crew (except the navigator and pilots) were sitting down when we bashed ourselves onto the pavement. One man was leaning against a sensor operator's chair and was knocked flat on his back on touchdown. Another crewmember was slammed sideways into the edge of the navigator's console on impact. Why no one was seriously injured is a mystery.

This circumstance opened many questions and ignited a few tempers. Why the experienced flightcrew did not sense we were descending without having it announced to them is a valid question. Why they didn't prepare themselves to land when it was obvious from the sound of the aircraft that the landing gear was being extended is also a valid question. But the central fact is that the normal, mandatory crew steps prior to landing patrol aircraft were not taken, and no effort was made on the part of the PPC and C/P to gain acknowledgement from the rest of the crew that they were ready to land.

Looking back, I feel certain that fatigue played a major role in this sequence of events. But, in any case, it points out that there are very few, if any, things that can be assumed when involved in professional aviation. There is no room for laxity. There is no room for a sloppy, half-baked performance. And there is no excuse for what happened. ◄

THE AN/PRC-90 SURVIVAL RADIO

By PRCM G. C. Kikos, USN



THE AN/PRC-90 is the newest personal-sized radio set in the Fleet. It is the prime radio for Fleet squadrons and, when available, will be used for all commands.

The AN/PRC-90 radio set is a dual-channel, self-powered personal emergency rescue transceiver. You use it principally for two-way voice or MCW (modulated continuous wave) communication with rescue aircraft. It can transmit tone (MCW) and swept-frequency homing beacon signals to guide rescue efforts. It is compatible with UHF AM radios such as the Radio Set AN/ARC-34 and Direction Finder Group AN/ARA-25.

The PRC-90 is designed to provide:

1. Two-way communication over a range of 60 nm to aircraft operating at 10,000 feet altitude.
2. An ADF (automatic direction finder) range of 50 nm and a tone range of 80 nm to aircraft operating at 10,000 feet altitude.

In general, the signal range increases proportionally with the altitude of the rescue aircraft, provided that line-of-sight is not obstructed. You can expect degradation when the radio set is operated in bad weather or jungle areas.

The radio set weighs about 1½ pounds and is 23 cubic inches in size. It is factory set to provide two fixed operating frequencies: the 243.0 MHz guard channel and the 282.8 MHz alternate channel. It is powered by a +14.0 VDC mercury battery keyed to fit into the radio only in the right position.

There are three modes of operation on the guard channel to aid in search, location, and rescue operation:

- The beacon mode of operation transmits a variable frequency which sweeps from 1000 to 300 Hz, then returns instantaneously to the 1000 Hz frequency and repeats the cycle. This occurs 2 to 3 times per second. The swept-tone signal is readily distinguishable from other signals or noise. During search operations, the pilot or radio operator of an ADF-equipped aircraft uses it for homing in on the survivor. The MCW and beacon modes extend the one-way communication range of the AN/PRC-90 beyond the range attainable in the voice mode.
- The voice mode permits two-way voice communications with another AN/PRC-90 or with compatible airborne communications equipment.
- The MCW mode transmits a 1000 Hz tone when the MCW button is depressed. This mode is intended primarily for Morse Code communication in covert situations when used in conjunction with the earphone. You can also use MCW for general purpose signaling.

Only the two-way voice communication mode is available when operating on the 282.8MHz alternate channel. The voice operating range is the same as for the guard channel. Once they are located, the alternate channel should be used for further communication to keep the guard channel open for other distress operations.

The AN/PRC-90 radio set has four operating controls conveniently located to permit operation with either hand, gloved or bare.

1. PUSH TO TALK button.
2. VOL (volume) control.
3. Four-position function switch.
4. MCW button.

The antenna is a flexible rubber-covered whip – it can be bent around the radio set for stowage, but you must extend it for efficient operation. Since the antenna is rubber-covered, it is subject to abrasion, cuts, tears, and pinholes unless you handle it properly. Careless use can puncture this cover. Subsequent immersion in salt water will cause rust, discoloration, and stiffening of the antenna. While this will not affect the radio's performance (nor will immersion of a bare antenna in water cause electrical damage), antennas with breaks in the covering should be replaced.

A miniature earphone comes with the AN/PRC-90. The earphone, stored in a case on the carrying strap, lets you operate the set quietly.

The PRC-90's rugged, watertight aluminum case protects internal circuits. The radio set is designed to operate satisfactorily after immersion in water depths of 50 feet.

A threaded cap at the bottom of the radio secures the battery and externally seals the battery compartment. Because this compartment is sealed from the rest of the radio set, you can change the battery under adverse weather conditions without exposing any electronic circuits.

Design characteristics of the AN/PRC-90 are shown in Fig. 1.

The radios and beacon assembly described in this article and the AN/URT-33 and AN/PRC-63 have certain peculiarities that you, as a user, should understand. Briefly, during parachute descent, varying ground-plane shadowing or directional effects cause unusual beacon radiation patterns or propagation. This increases effective range two to four times. Once you have touched down, however, you can expect a large reduction in range which can be significant if the antenna is not oriented in a vertical position.

On the ground, when the radio antenna is held in a vertical position, the radiation pattern is like a doughnut with a very sharp, null overhead. The signal is reduced greatly when the energy passes through heavy foliage. Studies indicate that you can expect an attenuation of 90 db per tenth of a nautical mile in a typical jungle-type environment.

Adhere to instructions for preventing inadvertent actuation of radios and beacons and observe the following precautions:

1. When on the ground, try to operate from a relatively clear area.
2. Freezing temperatures (32°F or 0°C) significantly

OPERATIONAL FEATURES

Operating Modes	VOICE TRANSMIT: EMERGENCY FREQUENCY/RESCUE FREQUENCY VOICE RECEIVE: EMERGENCY FREQUENCY/RESCUE FREQUENCY BEACON TRANSMIT: EMERGENCY FREQUENCY MCW TRANSMIT: EMERGENCY FREQUENCY
Controls (4)	1. PUSH TO TALK 2. FUNCTION SWITCH: OFF, EMERGENCY CHANNEL, BEACON, RESCUE CHANNEL 3. VOLUME CONTROL 4. MCW KEY
Voice Receive	EACH CHANNEL WILL RECEIVE TRANSMISSIONS UPON SELECTION OF THAT CHANNEL
Earphone Jack	
Beacon Transmit	AMPLITUDE MODULATED WITH A RECTANGULAR WAVE, SWEPT FROM 300 Hz TO 1000 Hz AT 2 TO 3 SWEEPS PER SECOND

MECHANICAL FEATURES

Size (in inches)	Length	Width	Thickness
With Whip Antenna	6 3/16	3 1/16	1¼

Weight With Whip Antenna	24 ounces (approximate)
Battery Life	18 HOURS CONTINUOUS AT 25°C IN BEACON MODE; 10 HOURS AT -10°C

AN/PRC-90 Design Characteristics

Fig. 1

reduce the operating life of survival radio and beacon batteries. This is a temporary condition, however, and you can remedy it by putting the battery on a warm portion of your body.

3. Hold the antenna vertical and try to keep the radio more than 14 inches off the ground.

4. If trying to signal an aircraft that is at a high altitude or approximately overhead, tilt the antenna slightly in the direction which places the edge of the hypothetical doughnut on the aircraft.

Because all survival radios and beacons operate on the military distress frequency of 243.0 MHz, and because reception of signals on this frequency immediately alerts one or more of air-sea-land SAR operations, it is essential that these devices function only in an actual emergency. Testing should be carried out under strictly controlled conditions.

Radios and beacons are frequently handled by maintenance and aircrew personnel, however. As a consequence, they are subject to inadvertent actuation. Therefore, check the OFF switch each time the radio or beacon is handled. This can save rescue time and effort that would otherwise be spent in locating the transmitting radio or beacon. More importantly, reduction of inadvertent transmission can eliminate the possibility of jamming an actual distress signal. ◄

Bravo Zulu

2nd Lt John D. Bratten, USMC
VT-1

WHEN 2nd Lt Bratten took off in a T-34B on his second solo flight, there was no reason to expect anything unusual. Preflight, runup, and takeoff had been quite ordinary.

Since the syllabus called for touch-and-go landings, he was soon working the bounce pattern at an outlying field. At the completion of landing practice, 2nd Lt Bratten had started to depart the field when, at 400 feet with gear and flaps up, and in a climbing right turn, he felt a severe engine vibration accompanied by loss of power.

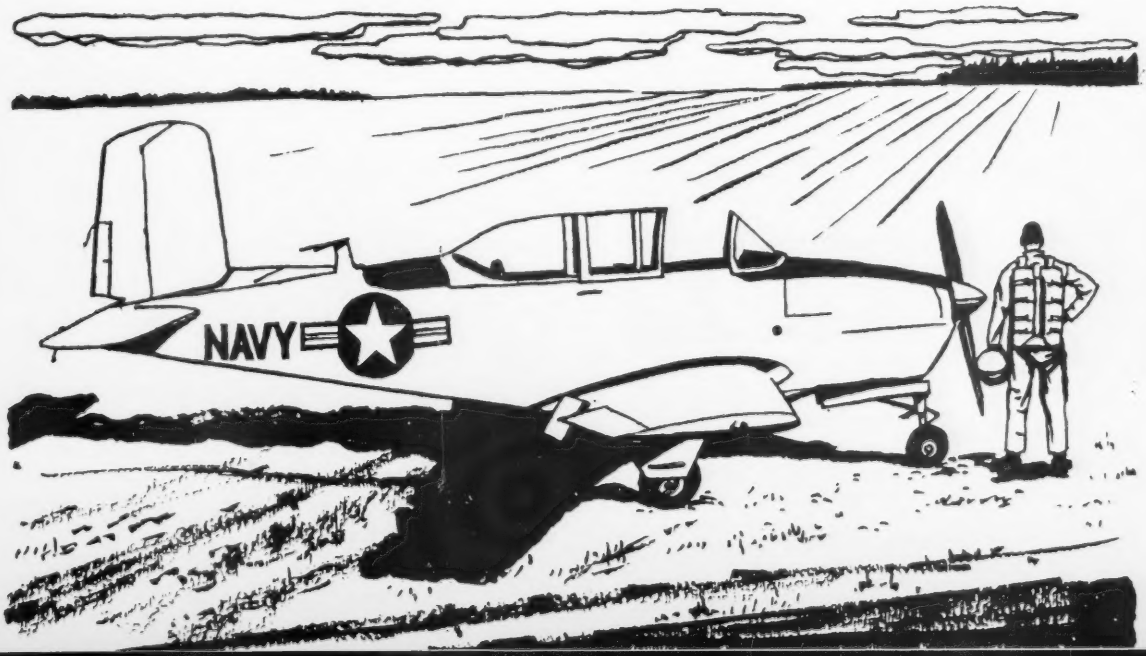
Continuing his right turn, he established a safe 90-knot glide and was about to select the emergency fuel system when the engine seized with the prop stationary in the 11 o'clock position. He continued gliding in a right turn while transmitting "Mayday" and looking for a landing site. The airfield was beyond gliding distance, but he spotted a farmer's field to his right.

He approached the selected field at an altitude of 150-200 feet and lowered the gear. When he was sure he had the field made, he lowered the flaps. He executed a slight flare just prior to touchdown. The *Mentor* landed in a freshly harvested soybean field and rolled 340 feet, sinking only a few inches into the soil. Second Lieutenant Bratten then exited the aircraft and awaited the prompt arrival of crash and rescue personnel. The aircraft was undamaged, except for the engine.

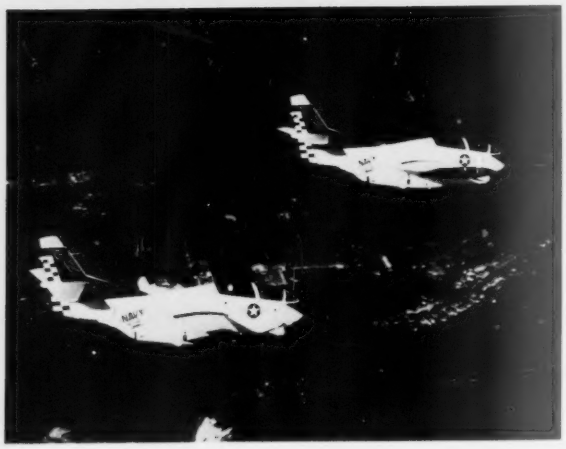
Postlanding investigation revealed that the engine had suffered a catastrophic failure. The crankshaft had broken causing the engine to seize, with no possibility of further operation.

Although 2nd Lt Bratten had only 17 hours total flight time, he came through this emergency like a pro. His sound judgment and flying skill prevented possible injury to himself and damage to the aircraft. He demonstrated that professionalism accumulates dividends from the first day of flight training.

Well done!



THE NICKEL-CADMIUM



BATTERY

By John C. Rosen
NAESU NATRA

THE nickel-cadmium (Ni-Cd) battery, as found in the T-2, T-39, and many USN helicopters, has proven to be a highly functional and effective supplement to an aircraft's electrical system. It has, however, several inherently dangerous characteristics which have led to aircraft mishaps. Therefore, the following background information and some "DO'S and DON'T'S" are presented to help flight personnel better understand how to live and fly safely with Ni-Cd batteries.

The nickel-cadmium battery, presently installed in both military and civilian turbine-powered aircraft, was brought to this country by the U.S. Army Signal Corps. The Germans, although not the originator of the battery, had developed the Ni-Cd battery to a sophisticated degree for use in their V-2 rocket program. One of the earliest uses of the Ni-Cd battery in an aircraft was to provide an onboard engine starting capability in the B-47s of the Strategic Air Command.

There are two types of Ni-Cd batteries – the sealed cell type and the vented cell type. Sealed cell Ni-Cds are used in low-power applications, primarily for emergency requirements. The vented cell Ni-Cd, used in large power applications such as turbine engine starting, is the type Ni-Cd battery to which this article applies.

This type battery has features that make it particularly suitable for aircraft use. Some of these features are its extremely high current output per battery weight, compactness and rugged construction, very rapid rechargeability, excellent low-temperature performance, and a relatively flat voltage output during the course of discharge at normal discharge rates.

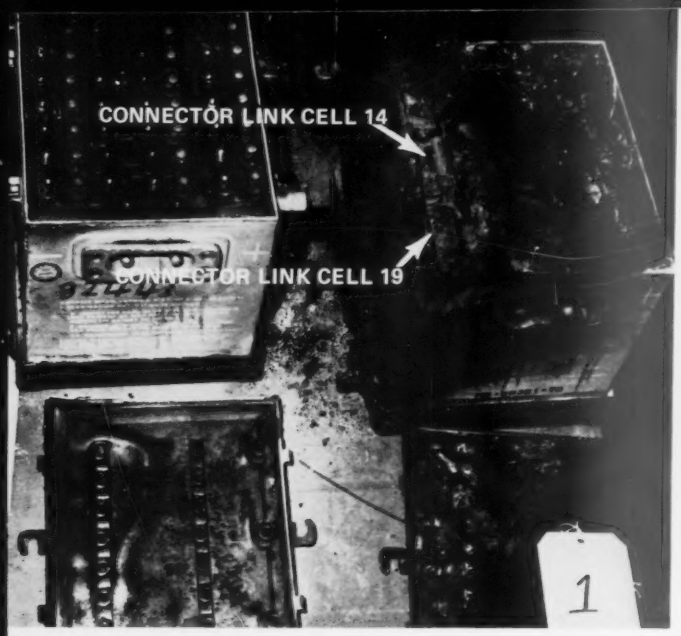
The Ni-Cd battery, however, is not devoid of peculiarities. It has been known to melt, blow up, warp, and burst. It has been a contributing factor in several accidents involving corporate and military aircraft. In one corporate turbojet, the batteries are located in a compartment adjacent to the fuselage fuel cell. In a well documented case concerning this type aircraft, the Ni-Cd battery went into *thermal runaway* and exploded, bursting into flames and rupturing the fuselage fuel cell. Fortunately, for everyone aboard, the fuel pouring out of the cell engulfed the battery and extinguished the fire.

Thermal runaway is the one detrimental feature of the Ni-Cd battery; it causes destruction of the battery and can result in the loss of the aircraft. Thermal runaway is more prevalent in Ni-Cd batteries utilized in turbine engine starting applications, although there have been reported incidents of what is thought to be thermal runaway of the batteries installed in today's modern pocket calculators.

Thermal runaway is an uncontrollable rise in battery temperature; the reasons for the temperature rise are many, varied, and beyond the scope of this article. Basically, what happens is: the rise in battery temperature results in decreased battery resistance which in turn causes an increase in battery charge current. The increase in battery charge current further increases the battery temperature resulting in a still further decrease in battery resistance. This causes an even greater increase in battery charge current. A vicious cycle is now in progress which can ultimately cause catastrophic failure of the battery. *A battery affected by thermal runaway can cause complete loss of an aircraft's primary electrical system.*

An overheated battery is not necessarily in a thermal runaway condition, and it is not true that an overheated battery will always lead to thermal runaway. Thermal runaway is actually a phenomenon.

A Ni-Cd battery, used in an engine starting application, is recharged by the aircraft's generators following engine lightoff. An aircraft generator charging a battery is a constant potential charging system with no current limiting capability other than the battery itself. A high initial inrush charging current will occur, as noted by the aircraft's d.c. generator ammeter being pegged on the high side. This is a desirable characteristic because it permits a rapid recharge of the battery. As the charging process continues, voltage builds up in the battery and reduces the potential difference between battery voltage and charging source (aircraft generator), bringing about a decrease in charging current. Theoretically, the charging current should reduce to zero; however, it never quite reaches that low value. In a normal battery, the charging current should drop to approximately 2 to 4 amps. *Should the charge current begin to increase above its*



Two batteries removed from the same aircraft. The battery on the right suffered thermal runaway whereas battery on the left only overheated.

Aircraft structural damage resulting from batteries in photo at left.

normal low value, the battery is in a thermal runaway condition.

As a result of the previously mentioned corporate turbojet incident, the FAA issued an AD (Airworthiness Directive) requiring all aircraft having a primary electrical system that includes a nickel-cadmium battery capable of starting the aircraft's engine or APU to have one of the following:

1. A battery charging rate control system.
2. A battery temperature sensing and overtemperature warning system.
3. A battery failure sensing and warning system.

Item 1 is the type of system the major airlines chose to satisfy the requirements of the directive. This system has inherent disadvantages in cost, weight, and complexity. (The Naval Air Test Center has tested a battery charging rate control system on a T-2C aircraft.)

Item 2 is the type system chosen by the majority of corporate turbine-powered aircraft operators. This system also has its disadvantages. Most of these temperature warning systems give an initial warning at a temperature of 140°F. A Ni-Cd battery could reach this elevated temperature as a result of several factors; e.g., ambient temperature, battery condition, number of engine starts during a particular day, etc., and not have a problem. On the other hand, a battery could be in the early stages of thermal runaway and the battery temperature not be high enough to activate the warning system. A number of batteries have gone into advanced stages of thermal runaway in aircraft equipped with temperature warning devices. In every case, however, the flightcrew did get a warning prior to the battery reaching such a state so that damage to the aircraft structure and/or a fire could be averted.

Considering the number of Ni-Cd batteries in the Navy inventory, a warning system capable of detecting the very first stage of thermal runaway is an absolute must – if not from a cost effectiveness standpoint, then from a safety standpoint. This type system falls into category 3 above. Such systems do exist and, in fact, one such system will undergo testing in the very near future at NAD Crane, the CFA (cognizant field activity) for batteries.

There are a few things flightcrews can do to prevent battery problems, decrease the chance of thermal runaway, or to determine, with reasonable accuracy, that a battery problem does exist.

Repeated unsuccessful battery start attempts should be avoided, particularly during high ambient temperature conditions. If an engine does not light off and accelerate to IDLE RPM normally, following the first or second start attempt, a third attempt could very likely set up battery conditions that might lead to a serious battery problem. Each engine start attempt will raise the battery temperature by approximately 15°F. Under repeated, unsuccessful start attempt circumstances, it is strongly recommended that a member of the flightcrew open the battery compartment and "touch test" the batteries. If they are too hot to rest a hand on, they should be allowed to cool before another start is attempted.

Heat dissipation in a Ni-Cd battery is very slow due to the large, densely packed mass of the battery. An even better idea would be to remove the batteries from the

Closeup of right-hand battery in photo at far left.

aircraft to an authorized battery locker for inspection. The battery touch test is also recommended following each and every flight. Battery locker inspection/test of batteries removed from an aircraft as a result of the touch test has proven the validity of this simple test.

Any time battery power will not accelerate an engine above 15-20 percent RPM, the batteries should be removed from the aircraft and sent to the battery locker. Starting an engine with a ground power unit following repeated unsuccessful battery start attempts can also lead to a battery problem. Under these circumstances, a touch test and monitoring of the d.c. ammeter are a must. *Never charge the batteries from an external power source while they are installed in the aircraft – even if authorized.* External power sources are generally very poorly regulated, and if used for charging Ni-Cd batteries, could cause battery problems.

What can a flightcrew do to monitor their batteries while in flight? Any aircraft having a d.c. generator ammeter has a battery failure warning system – *the ammeter.* Unfortunately, ammeters have poor accuracy and are located out of the pilot's normal scan. In addition, ammeters fluctuate in response to aircraft equipment demand on the generator. But should the ammeter, which normally indicates a load of less than 50 amps, suddenly start to indicate an increased load of 10-20 amps above normal (without additional circuits being energized), the flightcrew should conclude they have a battery problem. Turning the battery master switch to OFF will verify a battery problem if the ammeter drops back to its "normal" range and still indicates current flow. If a battery problem is confirmed, leave the battery switch OFF and land at the nearest suitable field.

Within NATRACOM, pilots have discovered battery problems utilizing the ammeter often enough to have become believers in this method of detection.

Summary of Ni-Cd Battery Do's and Don't's for Flightcrews:

✱• *DON'T* make repeated start attempts on the batteries.

• *DON'T* believe that a successful engine start using external power, following repeated unsuccessful battery start attempts, means a flightcrew can ignore the batteries for the duration of the flight.

• *DON'T* accept an aircraft if the Battery Service Card (attached to the front of the battery) shows the battery is beyond its service due date.

✱• *DON'T* make all battery starts if a series of short duration flights are planned.

• *DON'T* make an inflight engine start utilizing battery power unless specifically authorized by NATOPS.

• *DON'T* charge batteries installed in an aircraft with an external ground power unit.

• *DO* monitor the d.c. generator ammeters.

• *DO* turn off the batteries if the d.c. generator ammeter indicates a higher than normal d.c. load.

✱• *DO* land as soon as practical if turning the battery switch off confirms a battery problem.

• *DO* touch test the batteries to determine if their temperature has risen appreciably following repeated unsuccessful start attempts.

✱• *DO* allow hot batteries to cool sufficiently enough to pass a touch test prior to next start.

• *DO* recharge the batteries after No. 1 engine has reached IDLE RPM and prior to starting No. 2 engine.

• *DO* touch test the batteries after each flight.

Ni-Cd batteries will be around for a long time. There is a large group of people putting in a great deal of overtime and effort to resolve the battery problem.

Flightcrews, by understanding Ni-Cd battery DO's and DON'Ts, can be of tremendous assistance. A Ni-Cd battery is a sophisticated piece of equipment. If it is mistreated, it can and will bite you. Treated properly, it can save your life.

✱ *(NATOPS specifically addresses parameters and limitations which differ in various aircraft. See your NATOPS for detailed procedures. – Ed.)* ◄

Sneezin' Season

By LCDR D. O. Mazur, MC, USN
MAG-26

EACH year, warm weather heralds the return of grass, flowers, and pollens. This is followed almost immediately by a parade of suffering, sneezing, itching, and congested aviators to sickbay. Or even worse – to the corner drugstore.

Hay fever (your "squadron quack" will probably say "allergic rhinitis") is an allergic hypersensitivity of your nasal mucous membranes to any of a variety of compounds called antigens. In addition to pollens, people may react to dust, molds, foods, or even to bacteria growing in the nasopharynx.

When exposed to the culprit compounds, the mucous membranes become irritated and swollen. Many of the resulting symptoms can mimic the common cold, making self-diagnosis difficult and inaccurate. Although the classical case suffers from sneezing, itching, watering of the eyes, and nasal obstruction, it is not uncommon for less dramatic symptoms, such as only nasal obstruction, to occur.

Although efforts are made initially to prevent persons with significant nasal allergies from becoming aviators, the lack of symptoms and signs over much of the year makes such screening difficult. In fact, there are a large number of aviators with allergic rhinitis. And since this disease is most active in young adults it results in much downtime of naval aviators.

Because hay fever results in swelling of mucous membranes, the openings of sinus cavities and the eustachian tubes to the middle ears may be partially or completely blocked. Additionally, the existence of allergic rhinitis over a prolonged period of time results in the production of polyps which may further block these openings. The end result while flying is a sinus or ear block, either of which is painful and dangerous. Also,

vertigo may result, and it is even possible to lose consciousness.

As you can see from Fig. 1, air leaves sinuses during ascent. On descent, the ball valve action of either a polyp or the swollen membranes of a hay fever sufferer prevent pressure equalization.

One more bit of bad news – the little bottle of nose drops or spray that you can pick up from your local druggist for those stuffy mornings can hurt you, too. You know the ones! They say, "CAUTION, do not use for more than 10 days, etc." on the label.

Over a short term, these drugs make your air passages feel great, just as advertised. But after a number of usages, a "rebound" phenomenon develops, making the congestion worse after the medicine wears off. Then it's necessary to keep using it just to be able to breathe normally. In short order, you can become truly dependent on these medications. Over the long haul, abuse of these medications can destroy the membranes completely, producing a condition known as ozena for which there is no known cure.

What can hay fever sufferers do about this?

1. *See your flight surgeon.* He can find out if you have a cold, hay fever, a hangover, or whatever. For example, a stained smear of nasal secretions examined under the microscope may clinch the diagnosis. If you have significant allergic rhinitis, you may be treated in any of several ways. The use of antihistamines is widespread, but the danger of using these drugs while flying is well known. For aviators, a down chit while using them is a must.

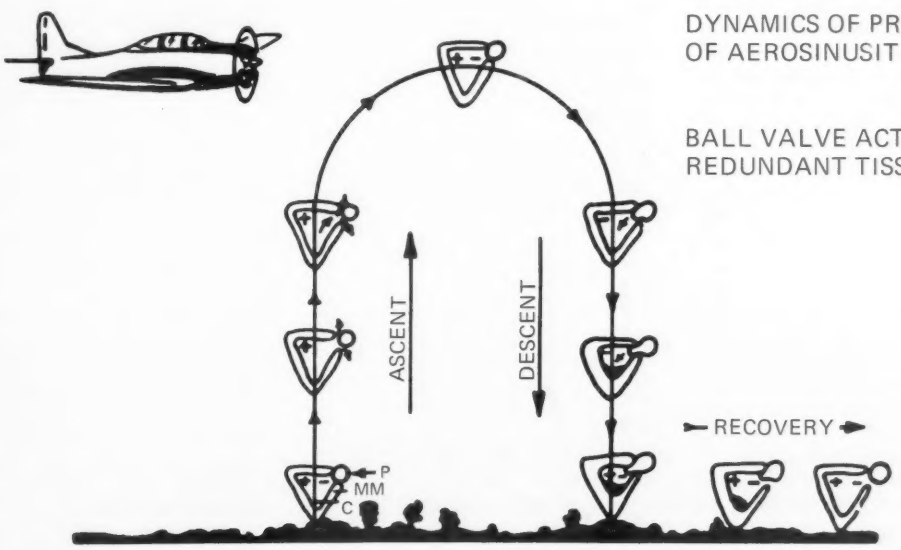
2. Much more satisfactory over the long term are allergy desensitization shots – a series of injections of a special individually prepared solution that will help your body "forget" the allergies that it has learned. Another useful measure is the application of topical anti-inflammatory drugs (steroids).

3. Associated conditions, such as the polyps mentioned earlier, must be discovered and treated.

4. Many treated aviators will be advised to carry a decongestant spray in their flight suits to use in the event they experience unusual difficulty equalizing pressures.

The complications of hay fever are not limited to jet jockeys. They may occur in helicopters at even relatively low altitudes. Sinus and ear blocks are generally preventable and result in much more downtime than the original disease.

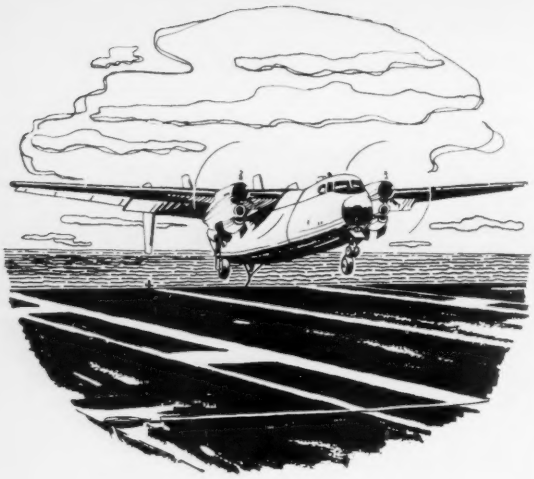
So, if you are subject to hay fever, when the pollen is flying maybe you shouldn't be. See your quack! ◄



EFFECTS OF BAROMETRIC PRESSURE CHANGE UPON THE SINUSES.

MECHANICS OF AEROSINUSITIS

Fig. 1



Letters

The man who never made a mistake never made a discovery.

Ace L.

Bouquets for Booboos?

Miami, FL – The modern naval air arm must be mighty hard up for aviators. In the old days (way back in the fifties and early sixties) when you got caught flying around with your head up and locked, you got zapped by the CO, *plus* being stuck for a round of cheer at happy hour. Nowadays you guys just keep passing out *bouquets for booboos.* It looks like pilots can forget good, sound, basic operational procedures, pull any foolhardy trick they can think of, and still end up as a candidate for an aviator-of-the-month award as long as they don't buy the farm or bend the bird.

For instance, let's review the article titled "Nowhere to Go" in the JAN '75 APPROACH. The starboard gear hung up due to a massive hydraulic leak and obviously free fell to the down and locked position. Herein lies the critter that shoots the pilot's tale full of holes. (It's pretty hard to get a normal hydraulic pressure reading with a massive leak in the system.) The crew failed to recognize this and the failure of the flaps to extend fully didn't jar them out of their lethargy either. Instead, they persisted with a hot approach, left valuable real estate behind them, then finally awakened to the problem on the landing roll.

By the grace of God they managed to stop before running off the end, but you credited this stroke of luck to "crew knowledge, training, cockpit coordination, and communication."

A real heads-up crew would have recognized the problem, taken the bird around, and used the auxiliary and emergency hydraulic systems to lower the flaps and assure pressure for the binders on rollout. Then they would have completed an uneventful landing and the incident wouldn't have merited a writeup in APPROACH.

MAJ Tom Watson, USMC (Ret.)

● We'll stick by our original kudos. Although a continual watch on the hydraulic pressure would have undoubtedly revealed falling pressures, it is possible that the crew read acceptable pressures once the gear came down and locked, even with a massive leak, because it requires a period of time to lose sufficient fluid to affect pressure. In the press of an instrument approach and prelanding preparation, the crew had more important things to do than fixate on the hydraulic pressure gage.

The crew might have deduced something from the lack of pitch change when flaps were lowered and perhaps they should have checked hydraulics one additional time during the approach. But for just about every aircraft mishap that has ever occurred, it is possible to point to some aspect of the incident/accident and say, "If such and such had or had not been done, the mishap would never have occurred." This, however, is not a realistic or valid approach to mishap investigation.

Pilots are human and have to be expected to have realistic limitations and capabilities. What cannot be expected or tolerated is lack of knowledge of emergency procedures once a problem is recognized. This crew reacted in a timely, correct manner to an immediate action emergency and prevented damage to an aircraft. That's sufficient for us.

NOT Ready on the Right

LPH At Sea – K-E-E-R-A-C-K, zziinngg, splat! Whatinhell's going on I thought? I was on the signal bridge watching flight operations when I heard the unmistakable sound of rifle fire. I proceeded to the starboard side and saw the skipper firing an M-14 into the water.

Since I didn't want him to tell me to MYOB, I didn't question the action. However, I raised my eyes skyward a few degrees and saw three helicopters in the delta pattern. Later the pilots and a crew chief of one helo reported they had seen someone with a rifle on the bridge.

We had seen a few whales in our general area, but no one made mention of Moby Dick. It's one thing to be shot at by the bad guys, but when someone with a white hat is shooting in your direction, it becomes disconcerting. Now, I want all you nit-pickers of flight pay and combat pay to pull in your horns.

Justa JO

Wings Folded

NAF Detroit – I read your Weekly Summary 40-74 with interest, a bit of amusement, and a great deal of concern. One would think in this modern day and age that things of this nature just couldn't happen. The article points out

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

six actual takeoffs, three aborted takeoffs, two ejections, and one gear-up landing with wings folded, involving several types of aircraft. I'm not an aviator but have been in the aviation field for 16 years.

I know that every pilot is busier than a one-armed paperhanger during takeoff. So, he needs all the help he can get. To make a long story short, steps should be taken to prevent the possibility of hurling oneself into the air with wings folded. A warning light which would illuminate any time the wingfold handle is not in the spread position is one possibility. Another is a lock for control surfaces to prevent control stick movement when the wings are folded.

Certainly there are others, some of which have already been incorporated in later model aircraft. The question is then "what is the most economical means of installing a warning device for those aircraft which have no warning provision?" This is normally left to the experts and now is not the time to change the procedure. However, I'd think that a simple warning light on the annunciator panel would be the most economical way.

I don't know the figure, but I would imagine that the loss of an aircraft involves several million dollars. Why couldn't the cost of losing an aircraft be weighed against some low-cost installation?

I know your mail must be tremendous, but I appreciate the time you've taken to hear from a concerned maintenance/material control officer.

LTJG Edward W. Lambing
VS-73

• The main causes of these types of mishaps is not lack of warning devices but distraction created by various factors. By way of illustration, much emphasis was placed on installing a wingfold caution light in the A-7 since its design predecessor, the F-8, had several instances of wings-folded takeoffs. Yet even with this light, the A-7 has been vulnerable as three intrepid aviators have attempted flight with decreased wingspan. The warning devices were overlooked in the process of getting airborne to meet a schedule or because of some other urgency. Experience shows that these mishaps continue to occur in spite of measures which have been taken to prevent them. The cheapest device of all is a takeoff checklist. Now, if only pilots would use the checklist EVERY time, these mishaps would be eliminated.

On Inflight Refueling

Norfolk, VA – A problem mentioned in the "Teamwork" article, FEB '75 issue, concerns this "Blackshoe." That was the compatibility of the *Skywarrior* and the KC-135 tanker, or rather the lack of compatibility.

I recall a similar problem in 1966, while air-controlling on the Tomcat/Forward SAR ship in the Tonkin Gulf. An Air Force F-4 had been hit over Haiphong, was losing fuel, and headed for the gulf. He urgently required a tanker. The CVA, about 80 miles to the south, had a KA-3B overhead. We proceeded to join the two aircraft, only to find the systems not compatible. Mad scrambling of a KC-135 out of Danang was the only thing that saved this bird, and possibly the two souls onboard.

As air controllers, we should have been aware of this incompatibility, but we weren't. Why haven't the Navy and Air Force gotten together and made these systems compatible, especially since both services operate alongside one another in a combat environment?

Name Withheld

• The Air Force has a requirement to refuel bomber aircraft such as the B-52. Because of its size, the most practical way to refuel is to fly the B-52 into position behind the KC-135 tanker and have an operator in the KC-135 tanker "fly" a boom into position so that it mates with a receptacle on top of the B-52. Other USAF aircraft (with one or two exceptions) are configured to be compatible with the above tanker concept.

The Navy, on the other hand, must have tanker aircraft which are capable of operating off a carrier. With the possible exception of the A-3, none of these aircraft is large enough to accommodate a boom and operator. Therefore, the Navy developed the probe and drogue system of refueling, where the receiver aircraft maneuvers to put his probe into a nonmaneuverable basket and hose assembly.

Things are not quite as incompatible as they seem, however. KC-135 aircraft can be configured to refuel Navy aircraft under certain circumstances, provided sufficient notice is given. Nevertheless, since the Navy and Air Force have different basic requirements and constraints as far as inflight refueling, there is little likelihood of complete commonality of systems in the near future.

Wants Historical Articles

USNTC, San Diego – In the July 1972 issue you had an article entitled "Pioneer Years – Part I," and in a later edition, Part II. Since this time, I have been unable to find the additional historical articles on World War I, the Roaring Twenties, the Thirties, World War II, Korean War, and Vietnam, which were promised in the original article. I would like to get the missing articles, if possible.

IMC Howard L. Bown

• You could not find the articles because they were never printed. After printing Parts I and II of "Pioneer Years," APPROACH decided to leave the publication of such historical articles to *Naval Aviation News*. There have been many historical articles in that outstanding publication and we suggest that you research back issues for historical information on naval aviation.

A Little Humor

NRC Miami – LT Wilkes' "attempt at a little humor" ("How SIERRA HOTEL Are You?", APPROACH JAN '75) was truly a masterpiece. This old LCDR (YG 54) took 30 minutes getting through the test I was laughing so hard. I can still remember that "hot" rendezvous in the old SNJ when I dropped the "speedbrakes" (flaps) and wrinkled the wings. Articles like this lighten my day after flying this desk for the past 2 years. Even we drivers of big old prop jobs (P-2, C-54, PB4Y) can relate to this one and get the message. As anticipated, I scored 40. Many thanks.

LCDR Bill Norris
NRC Miami

P.S. What's a G-suit?

CORRECTION

There was an inadvertent error in LT Umbarger's article "Aren't All Helicopters Alike?" in the APR '75 issue. On pg. 15, it is stated that the NATOPS limit for engaging and disengaging rotors for the H-46 is 20 knots from 330-030 relative. This is incorrect. The correct limits should be 20 knots from 360 (000 for the blackshoes) – 030 relative.

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approach

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Our product is safety, our process is education, and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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CREDITS/Cover: June's cover by Lockheed artist Chuck Hodgson depicts the S-3A *Viking* as it prepares to make its first Fleet deployment. The *Viking* tradition is illustrated by the Norseman in the upper left, the Roman Bireme ship in the lower right, and an Astrolabe — a celestial sighting instrument of the 16th century — in the center. The aircraft carrier JOHN F. KENNEDY (CV-67) shown in center right will stage the S-3 on its first deployment. In the lower left is the outline of electronic displays in the S-3 cockpit. Photos pg 24 by Harry Gann.

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From My Point of View

RADM Wm. H. Ellis

I'D like to share with you the impressions which I have gained since my assignment as COMNAVSAFECEN. I have always been aware of the need for safety in naval operations, but have only recently become fully aware of the immense overall cost to the Navy from accidents. For example, during one 24-hour period we lost an F-4 as a result of a departure/spin; a destroyer suffered over $1,000,000 damage from a fire/explosion caused by a welding spark and a jet engine test cell received $325,000 damage, also by fire.

We can measure the cost of accidents many ways; the tragic loss of life and the sensational dollar losses, to name two. But, whatever way we measure this cost, there is a direct and measurable loss of readiness to the Navy. We must do our utmost to maintain readiness through safety.

From the daily flow of mishap traffic across my desk, it has become patently obvious that three distinct and historical problems still plague naval aviation. It concerns me that we have lived with these problems for so long. We must not accept them as incurable – as a normal, if hazardous, part of naval aviation.

First and foremost, we have the stall/spin/departure syndrome. By whatever name, it is still with us and increasing this year. Since February, six of our aircraft have fallen out of the sky as a result of inability to control an out-of-control condition. From a preliminary analysis, I am convinced that these losses can be dramatically reduced without sacrificing mission capability. The attainment of this objective will be a matter of first priority. (Your attention is invited to the article *ACM With Safety* by VF-111, on pg. 14 of this issue as an example of one approach to this problem.)

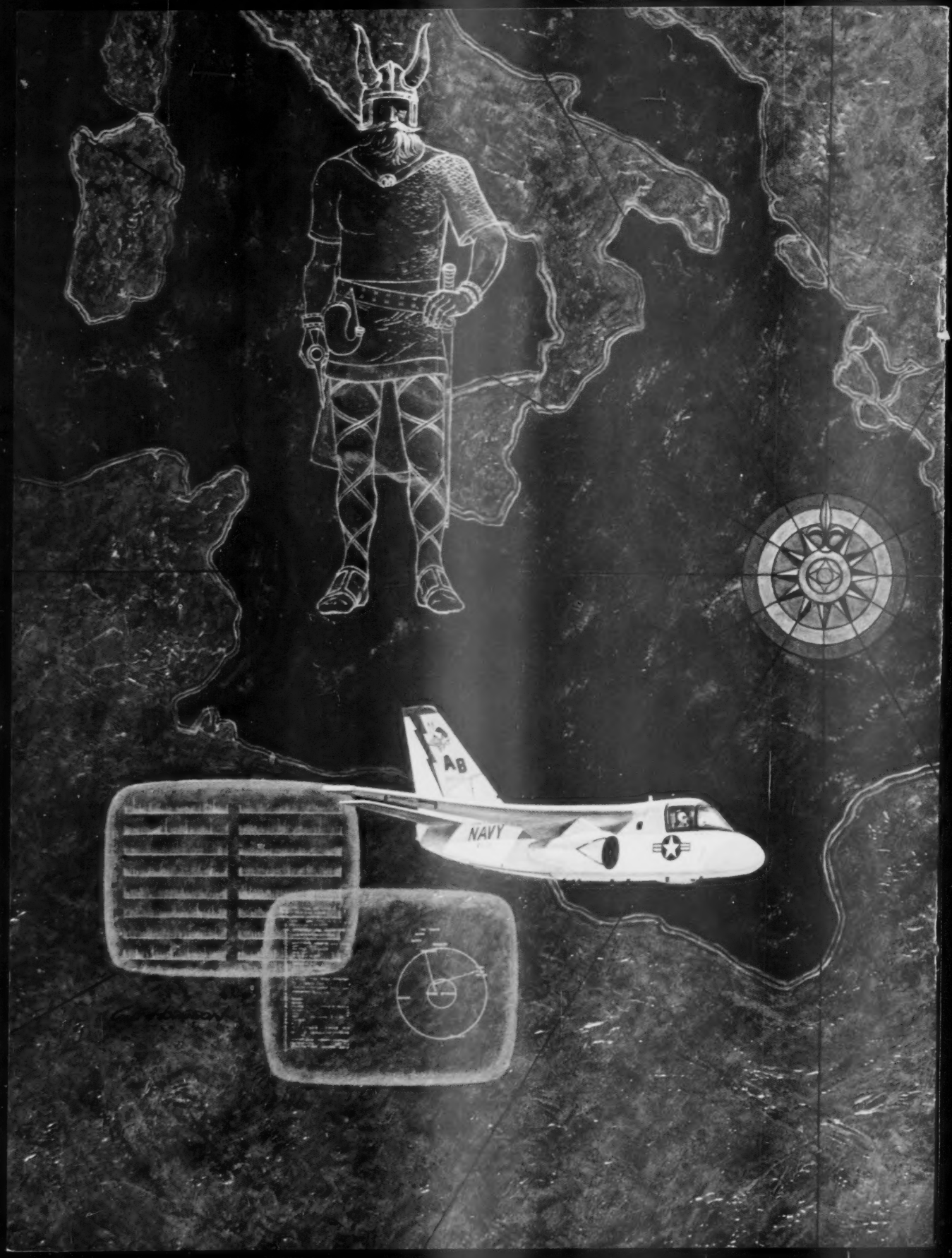
Second is the ground accident syndrome. During the first 9 months of this fiscal year, we lost $2,727,430 in "crunches." When one is on the receiving end of these reports, it sometimes appears that every yellow gear driver in the Navy has a deep-rooted hostility toward aircraft – and is unqualified/unlicensed, to boot. This is not true, of course. Only 19 out of 156 crunches so far this year have been caused by unlicensed/unqualified drivers, but this is far too many. There can be no excuse for losses of this nature and we should immediately eliminate them and go to work on eliminating the more difficult causes due to tempo of operations, lack of communication, lack of supervision, etc.

The third area is tool control. Another mundane subject? Not at all. NAVSAFECEN investigators find tools adrift in 75 percent of their crash investigations. This is not meant to infer that 75 percent of our crashes are caused by tools adrift – but they're there. My maintenance types tell me there has been some recent progress in this area (refer to MECH, Spring '73, '74, and '75 issues), but we have a long way to go. Tool control doesn't come for free. It takes time and effort, but it's time and effort well spent when weighed against the cost of accidents, and the loss of readiness.

The Safety Center can publish cause factors and suggest approaches to accident prevention, but an absolute requirement for the success of any program is the motivation of all hands. I repeat, *motivation of all hands.* The OIC of motivation in any command is the CO. Over to you, skipper!

RADM ELLIS was designated a Naval Aviator in September 1945. His operational experience includes tours with Bombing Squadron EIGHTY-TWO, Attack Squadron ONE SEVEN FOUR, FAWTULANT Bravo, and the Naval Air Advanced Training Command. RADM Ellis served as Operations Officer, Executive Officer, and Commanding Officer of Fighter Squadron ONE FIVE FOUR, Commander, Attack Carrier Air Wing TWENTY-ONE, and Commanding Officer of USS RALEIGH (LPD-1). During his tour as CAG, Air Wing TWENTY-ONE spent 8 months deployed aboard USS HANCOCK (CVA-19) off the coast of Vietnam.

RADM ELLIS' personal decorations include the Legion of Merit, the Distinguished Flying Cross, Bronze Star, Air Medal, and the Navy Commendation Medal. He assumed command of the Naval Safety Center on 21 March 1975.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